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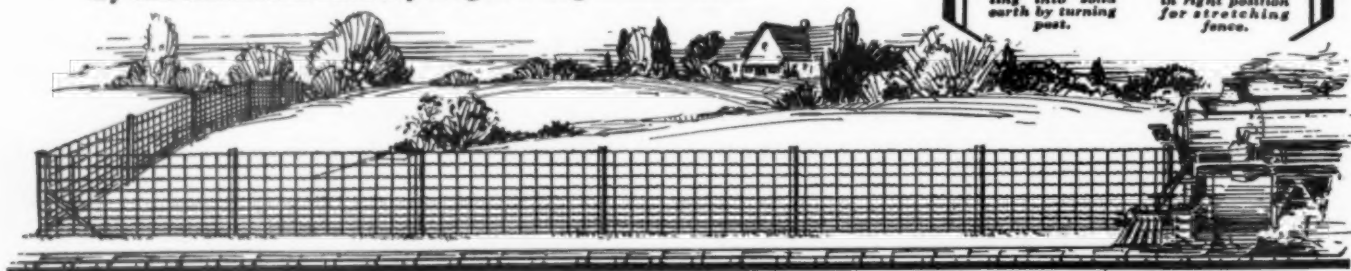
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Figure 1
Showing folded
anchor in bottom
of hole, hole 37"
deep, 9" wide.



Figure 2
Expanding an-
chor, partly
opened and cut-
ting into solid
earth by turning
post.



Figure 3
Anchor expanded.
Post can be
turned around as
many times as
necessary clock-
wise to bring post
in right position
for stretching
fence.

Railway Age

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January 25, 1930

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The Proposed Depreciation Policy

ONE of the most important questions before the Interstate Commerce Commission is the disposition it shall make of Commissioner Eastman's proposed report and order regarding accounting for depreciation. The adoption by the commission of Mr. Eastman's proposed report would involve much more than merely changing the way in which figures are entered in the railway's accounts. It would affect both charges to operating expenses and the valuation on which the railways would be allowed to earn a return in ways extremely adverse to the railways. The Supreme Court of the United States, in the case of the United Railways & Electric Company of Baltimore, recently has rendered a decision which has a direct bearing upon Mr. Eastman's plan.

Depreciation may be set up in the accounts of a railroad or public utility for two widely different purposes. One of these is to show the extent to which depreciation of the plant that is properly chargeable to operating expenses is occurring in the conduct of business. The other is to show the allowance that should be made for depreciation in arriving at the valuation upon which a return should be permitted to be earned. The proposed system of depreciation accounting confuses these two purposes, and would both prevent the railways from making adequate charges to their operating expenses and deny them an adequate valuation, and in both these ways tend unduly to restrict the net operating income they would be allowed to earn.

Inadequate Charges to Operating Expenses

From the time a property is constructed all the costs incurred to keep it up to its original condition are properly operating expenses, while all that are incurred to improve it are properly capital charges. The charges to operating expenses for the replacement of the various parts of the property that are worn out or become obsolete may be made in either of two ways, or partly in one way and partly in the other. There may be made currently charges for "depreciation" which are assumed to be equal to the depreciation that occurs in the various parts of the property; or the entire cost of replacing any part of the property with an equivalent part may

be charged to operating expenses at the time that the replacement is made. Previous to the adoption of the commission's uniform system of accounting in 1907 it was the usual practice of the railways to wait until a rail for example, was retired, and at that time charge to operating expenses the entire cost of replacing it. The commission's original system of accounting provided for the setting up of charges for depreciation of equipment; but what may be called "depreciation" accounting, as distinguished from "replacement" accounting, has been used by the railroads only to a limited extent. In consequence, for most existing parts of the railroad plant no depreciation reserves have been accumulated.

Under the policy favored by Commissioner Eastman depreciation accounts would now be set up for practically all the numerous and various parts of the railroad plant, and would be based upon the estimated total "service life" and actual cost of these parts. If, for example, it should be assumed that the entire life of a bridge would be 100 years, depreciation would be charged against it at the rate of one per cent a year. If the bridge were now 50 years old it would be assumed that one-half of its service life was gone, and future charges for depreciation would build up a reserve sufficient to pay for only one-half of its replacement at its original cost. Whence, then, at the termination of its life, would be derived the other half of the money required to replace it? It would have to be derived from new capital and charged to capital account.

Commissioner Eastman's proposed system of depreciation accounting assumes that in some way the owners of the railway already have been "reimbursed" for the loss of the first fifty years service life of the bridge, which, on his theory, should have been charged to operating expenses, but which actually has not been. In what way, on his theory, have they been "reimbursed"? Presumably through the reporting of an average annual net operating income which has exceeded a fair return. But the commission's own reports show that the railways as a whole have not, in the past, reported a net operating income in excess of a fair return upon their investment. It follows that they have not been "reim-

bursed" for the past depreciation of parts of their property that are still in use; and as they would not be allowed to charge this past depreciation to future operating expenses, they would never be able to charge it to operating expenses at all. This denial of their right to charge to operating expenses the entire cost of replacement of parts of their plant as they were retired would inflate the net operating income reported by them, and thereby tend to prevent them from being allowed actually to earn a fair return.

Ignoring Present Conditions and Costs

Mr. Eastman's proposed policy of charging depreciation to operating expenses has one other vital shortcoming. Many existing parts of railway plants were installed prior to 1914 at costs much lower than now prevail. Under his plan the depreciation charges for these parts would be based upon the costs incurred in installing them. The result would be that the depreciation reserves built up would never be large enough to pay for their replacement. Suppose that a particular structure cost \$1,000 in 1913, and would now cost \$1,500. Only \$1,000 of the cost of replacing it when it was retired would be charged to operating expenses, and presumably the other \$500 would have to be charged to capital account. Here, again, the result would be that the entire cost of maintaining the property in its original condition would not be charged to operating expenses, but that presumably part of it would be charged to capital account, and that both the capital account and the net operating income reported would tend to be inflated.

It might be thought that the result of thus charging to capital account in future what were actually operating expenses incurred in the past would be to at least give the railways an inflated nominal investment on which they could demand a fair return in future; but the proposed system of depreciation accounting includes a means of very effectively forestalling this. It is based upon the assumption that any part of a railway plant a portion of the "service life" of which has been used up has declined an equivalent amount in value. Furthermore, the commission's policy of valuation thus far has been based fundamentally upon the principle that the valuation of a railway property should be its actual cost, less depreciation. Being unable to ascertain the actual cost of railway properties up to June 30, 1914, it has made estimates of the cost of reproduction at that time, which are based upon the wages and prices then prevailing, and which are assumed to be practically equivalent to the actual investment. If, prior to 1914, one-half, for example, of the service life of any part of a railway plant that cost \$1,000 had been used up, this part is assumed to have had at that time a value of no more than \$500; and it is proposed in the projected system of accounting that each railway shall enter into its accounts the commission's so-called estimate

of "cost of reproduction," less the amount of depreciation the commission claims has accrued. The resulting figure would be the amount upon which the railway would be entitled to earn a fair return. Thus, an amount equivalent to the entire "accrued depreciation" claimed by the commission to exist would, in effect, be taken from the railways before they would have any chance to begin inflating their capital account by charging to it replacements not partly provided for by past depreciation charges. The railways would thus lose by being given a valuation for rate-making purposes and recapture based principally, not on present value, but on past cost of construction, and also by having deducted even from their past investment all the depreciation that the commission claims has accrued in their properties in the past.

Counsel and witnesses for the railways have presented to the commission powerful arguments in support of the proposition that "replacement" accounting is preferable to "depreciation" accounting, because "replacement" accounting is based on facts, while "depreciation" accounting is based upon assumptions as to the probable "service lives" of different parts of the railway plant which are more likely to prove incorrect than correct. Obviously, however, regardless of the comparative merits of "replacement" and "depreciation" accounting, the application of a system of depreciation accounting to a new railroad, or to new parts of an old railroad, is a widely different thing from applying it to old parts of existing railroads in the way that Commissioner Eastman proposes to do.

The Supreme court, in its decision in the United Railways & Electric Company case, made clear why the system of depreciation accounting it is proposed to apply to the railways is both economically and legally unsound. It is unsound because it would forever deprive the railways of opportunity to charge to their operating expenses depreciation which actually has accrued in the past, but which has not in the past been charged to operating expenses. It is unsound because it disregards the legal principles that, in making valuations and prescribing depreciation accounting, a regulating commission must give due weight to present day costs, and that the depreciation allowed for in making a valuation must not be theoretical but actual—that is, it cannot be arrived at merely by making estimates of accrued depreciation based upon estimates of the "service lives" of the parts of a plant, as is proposed, but must be determined by actual inspection of the property.

Supreme Court on Depreciation

In the United Railways & Electric Company case the Supreme court held that an annual return of 6.26 per cent is inadequate, and that "it is not certain that rates securing a return of 7½ per cent or even 8 per cent on the value of the property would not be necessary to avoid confiscation." On no possible basis of

computation have most railways in the past earned any such returns, and therefore the assumption that they have been "reimbursed" for past depreciation not heretofore charged to operating expenses is wholly untenable. The court in this case also held that the depreciation chargeable to operating expenses cannot be limited by the original cost, but must be determined on the basis of the present value of the property "because, if values have advanced, the allowance (based on original cost) is not sufficient to maintain the level of efficiency." Said the court: "The utility is entitled to see that from earnings the value of the property is kept unimpaired, so that at the end of any given term of years the original investment remains as it was at the beginning." . . . This naturally calls for expenditures equal to the cost of the worn-out equipment at the time of replacement; and this, for all practical purposes, means present value. It is the settled rule of this court that the rate base is present value, and it would be wholly illogical to adopt a different rule for depreciation."

The methods and principles of valuation favored by the commission in the O'Fallon case were held unsound by the Supreme court. Commissioner Eastman's proposed policy of depreciation accounting would also be condemned by the Supreme court if, in a railroad case, it should, as it doubtless would, decide as it did in the United Railways & Electric Company case. With these two decisions confronting it, the commission apparently should see clearly that its future policy regarding both valuation and depreciation accounting must be made to recognize present conditions and costs if it is to receive the approval of the Supreme Court.

The Montreal Report on the St. Lawrence Waterway

THE report to the Montreal Board of Trade of its two engineering consultants on the proposed St. Lawrence Deep Waterway, which was summarized in the *Railway Age* of January 11, discloses a realistic point of view on waterway development which is but too infrequently evidenced south of the international border. "In many discussions of the St. Lawrence River project, especially from American sources," the report reads, "this work is referred to as if it were a new route for grain from the West, and many writers have ignored the fact that the existing canals have provided during a period of about thirty years a very satisfactory route for all the grain that has been offered for transport."

The italics are ours, and point to what seems to us a most significant fact regarding waterways, present or projected, viz., that, in spite of lower rates, nevertheless they are rarely utilized to capacity. Waterway ad-

vocates, by ignoring this pragmatic fact and attributing maximum utilization to their projects are thus able grossly to exaggerate estimated "savings" in transportation costs. The report to the Board of Trade shows the cost to vessel owners of moving grain from the head of the lakes to Montreal via the existing all-water route to be 6.99 cents a bushel. Actual rates via this route were shown in the Institute of Economics report on the St. Lawrence project to range from 6 cents to 12.5 cents with the average about 9 cents. The lake-rail rates on grain from the head of the lakes to tidewater at New York were shown to average somewhat higher than 11 cents a bushel. But, says the report to the Board of Trade, the present St. Lawrence waterway facilities are now being used by shippers to only 50 per cent of their capacity.

The cost to vessel owners of grain movement from the head of the lakes to Montreal via the proposed deep waterway is estimated by the engineers at 4.93 cents a bushel. Comparing these figures, we see that transportation costs (not including interest on the investment in waterways) via the proposed deep waterway would be about 2 cents a bushel less than such costs by the existing waterway. This is the same differential that the existing all-water route offers under lake-rail rates; and yet only a relatively small proportion of the traffic moves by the all-water route. Plainly there are considerations other than rates alone which influence the routing of export grain. Moreover, the saving in operating costs to be expected from the deep waterway, the engineers estimate, would pay interest on only about half of the investment necessary to provide it.

Important in its bearing on the probable utilization of the proposed waterway is the quotation from the testimony of the Canadian Marine Association. This association stated that "the larger craft from the upper lakes will never be subjected to the perils of St. Lawrence navigation between the lakes and Montreal." The route, it was contended, would be dangerous, would involve slow movement, is oppressed by fog, would not provide good anchorages and would be "dangerous or impossible" of navigation by lake vessels. It may be added that any disadvantages of the St. Lawrence waterway to lake vessels would probably apply with equal force to ocean steamers.

The character as well as the intelligence of an individual are reflected in the manner in which he spends his money. The man who expends his income and his savings for wildcat stock and ostentatious luxuries, while his family lacks the simple comfort of proper housing, is not only regarded as foolish, but his ethical standards also are seriously questioned. The grave doubts as to the economic justification of the St. Lawrence Deep Waterways, so clearly set forth in the report of the Institute of Economics on the project, are further emphasized in the findings of the Montreal engineers. Is there any essential moral or intellectual difference between the individual spendthrift and the government

which sinks the taxpayers' money in works which have no economic justification? The United States is a wealthy nation, but is it so entirely free from poverty and of opportunity for useful investment that it can afford without thorough study to sink irretrievably its millions in an enterprise the utility of which has been so authoritatively impugned?

A 99.99 Per Cent Record in Furnishing Cars

THE railways in 1929 came nearer rendering perfect service in furnishing freight cars to shippers than ever before. A comparison of the records of the number of cars loaded and of the number of "short-ages" reported shows that on the average in each week of the year they furnished to shippers, when and where the shippers wanted them, 99.99 per cent of the cars for which the shippers asked.

The figures regarding the filling of shippers' orders for cars during the last seven years tell a remarkable story. In the early part of 1923, in which year the railways adopted their big program for providing adequate and improved freight transportation, there was a car shortage which had extended over from 1922, in which year occurred the nation-wide strike of shop employees. Shippers in 1923 were furnished when they wanted them only 82.37 per cent of the cars for which they asked. The corresponding figures for subsequent years are as follows: 1924, 99.22 per cent; 1925, 99.69 per cent; 1926, 99.8 per cent; 1927, 99.88 per cent; 1928, 99.97 per cent; 1929, 99.99 per cent.

Of course, perfect service in furnishing cars throughout an entire year probably can never be attained, but it was attained in at least twelve weeks last year, there being no cases in those weeks in which a single shipper failed to get all the cars for which he asked. The present winter has been an unusually severe one, and it is therefore highly significant that during the eight consecutive weeks from the end of October to December 22 there was not in the entire United States a single failure to furnish a shipper with all the cars he wanted.

The almost perfect performance now being given in the furnishing of cars is due not only to the improvements that have been made in railway facilities and operation, but also to the co-operation of the railways and shippers through the Regional Shippers' Advisory Boards. The shippers in all parts of the country in their quarterly conferences with officers of the railways keep the railways advised as to where cars are going to be needed and the number that will be needed, and with this information the railways can distribute them in anticipation of future requirements.

The largest number of unfilled requisitions for cars

reported for any week of last year was for the week ended October 22 and amounted to 626. This was at the time of the peak movement of traffic. The railways in that week had a net surplus exceeding 110,000 cars, but it happened that at widely scattered points over the country they did not then have exactly the number of cars required. The only part of the country in which an actual shortage of cars was threatened at any time was in the southwest, when during the early summer months the wheat harvest was at its height. The wheat was delivered to the southwestern lines with unprecedented rapidity, but by close co-operation with the shippers they succeeded in making an almost perfect record in handling it.

When it is considered that there are about 2,500,000 freight cars in service, and that in order to handle the country's traffic they must be constantly distributed to almost innumerable stations and industrial and commercial plants in all parts of the country, the success of the railways and the shippers in securing an almost 100 per cent distribution of cars throughout a year of record-breaking traffic constitutes an extraordinary achievement.

Why Not Get an Early Start?

THE railroads are committed to large expenditures for additions and betterments to their fixed properties during 1930 and are now making definite plans for the award of contracts covering a wide variety of projects. There are good reasons why the actual placing of some of this work must be deferred until early spring, but many projects can be opened up now just as well as later. In fact, there are good reasons, other things being equal, why it is of advantage to get an early start. An important one is the opportunity it affords to obtain more favorable bids.

Owing to the decrease in building and manufacturing operations material prices have declined and contractors are competing actively for all work that is being advertised. Judging from the figures at which some work has been placed, it is evident that many contractors are submitting tenders affording but a small margin of profit with the object of getting sufficient work to keep their organizations intact. Obviously, this attitude will not prevail after the season's work has "opened up."

But granting that certain projects cannot be actively prosecuted until the season is more favorable, there is an advantage, which will be reflected in bids, in affording ample opportunity for orderly procedure in purchasing material and in organizing plant equipment. Too many contracts are placed with the requirement that the work will be started in full force on the following day.

The Feasibility of the I. C. C. Consolidation Plan *

Analysis of the various systems proposed from the standpoint of finance, traffic and the law

Part I

By F. J. Lisman

F. J. Lisman & Co.

THE long looked for consolidation plan for all the railroads in the continental United States appeared late in December. Its promulgation has had curious effects and repercussions. As usual, a definite stand on a highly controversial subject develops more criticism than praise. In consequence it would seem as though the desire for mergers on the part of the public and on the part of Congress may now actually be diminishing.

The Interstate Commerce Commission should not be blamed for this; it had asked Congress to amend the law which made it mandatory to bring out such a plan and Congress did not act. The Commission did its best and its report distinctly says: "While a clear majority of us, although not always the same majority, have agreed as to each part of the plan proposed, not all of us have agreed as to all its parts, but all concur in the result."

The Commission has a great many problems to solve. Undoubtedly it felt that all minds would probably never meet on all the problems connected with consolidations; therefore, presumably, it proceeded to vote to get the plan off its hands. The "concurring in part" opinions of several of the commissioners are really dissenting opinions which, within the body of the commission, are reported as sometimes being called "grouching concurrences."

Complete Agreement Not Expected

If, in 1920, the matter of allocating all the railroads of the country into a limited number of systems had been left to all the railroad presidents or to any given number from three upwards, very probably they would not have agreed on any plan thus far and probably never would. The same remark would apply to any given number of the people (including the writer) who have indulged in the favorite indoor game of drawing up railroad consolidation plans.

Commissioner Eastman (concurring in part) opens with the following paragraph:

Although I do not approve of it in important respects, I concur in the adoption of the consolidation plan above outlined because it has many good features, because it is necessary under the law to adopt some plan and because it is not very important after all, whether or not it is the best plan that could be devised. We may modify it at any time hereafter, and no consolidation for which it provides can be accomplished until we have found, after full hearing, that the public interest will be promoted thereby. There is, I think, much misunderstanding on

this point. The plan is very little more than a procedural step. There is nothing compulsory about it, nor even any assurance that authority will be sought to carry out the consolidation which it proposes. Applications for authority to effectuate certain unifications are now before us which in many particulars are inconsistent with the plan. The important time will come when we take action upon these and similar definite applications.

Commissioner Porter, supposed to be the commissioner who drew the original plan which seems to have served merely as a start for criticism, has the following to say:

Under the provisions of the law, the actual consolidations of the railroads must proceed on a voluntary basis. It follows, therefore, if this is to be accomplished, the proposed consolidation must be sufficiently advantageous as to afford an incentive to the carriers to go forward, subject always to the limitation that nothing be permitted which is not in the public interest. As much as we might desire a more perfect answer than under existing circumstances we can find we must accept things as they are and make the best adjustment possible that affords a reasonable probability of attainment.

In spite of all this, headway has been made by the promulgation of this plan. The railroad companies now should know definitely with what they may go ahead and that, if they propose something which is within the lines of the plan, they may expect the required authority to proceed, provided the financial structure is sound and that nothing develops at the hearings which might show that a particular part of their plan is not fully in the interest of the public. If propositions for merger or acquisitions are made which are not in line with, or which are absolutely contrary to, the plan, then the applicant will have to prove, the same as heretofore, that the proposed transaction not only is in the interest of the public, but does not interfere with something which might be more favorable to public interest.

Search for the "Least Obviously Impossible" Plan

Of course, there is room for differences of opinion on the merits of the plan, the same as on most other subjects. The real problem of the Commission was to bring out a consolidation plan which was the "least obviously impossible." According to the writer's and many other people's opinion, they did not quite succeed in this although, no doubt, the majority of the commissioners would not agree to this point of view.

The definition of a plan, "the least obviously impossible" is a plan which

- (a) can be carried out with a minimum of litigation;
- (b) can be carried out with a maximum of co-operation by the companies.

In this analysis it is proposed to deal with each one

* A 33 in. by 44 in. map showing each of the proposed consolidated systems appears elsewhere in this issue of the *Railway Age*.

of the 19 suggested systems, taking these two angles into consideration.

The Problem in New England

In dealing with the problem of consolidation in New England, the Commission had to arrive at a conclusion on two important points—

- 1—Shall there be but one system or more?
- 2—Shall the proposed New England lines be confined strictly to east of the Hudson River and Lake Champlain or shall they extend to a connection with the Great Lakes and all the trunk lines?

Considerable sentiment seems to have developed in New England in favor of one system. However, from a practical point of view, this would be impossible because the New York Central as the lessee of the Boston & Albany would not let go of that division. Furthermore, it would seem that Boston, more than any other Atlantic port, needs competitive service because none of the railroads west of the Hudson River loves Boston for the very obvious reason that their division of the through rate to Boston is less than what they receive for a haul to New York or Philadelphia. It is not even to the interest of the New York Central to haul commodities to the port of Boston as against New York, because New York is a distance of 146 miles from Albany, over a route which is a dead level, while it is 60 miles further to Boston with a haul across an 1,800 foot pass over the Berkshires and with a total rise and fall of about 3,000 feet. The heavy terminal costs at New York hardly absorb the difference in the cost of the rail haul.

Those who are in favor of one system for New England say that New England is really one territory and that the New York, New Haven & Hartford and the Boston & Maine exchange more traffic with each other than with any one road.

In New England, the cities where there is competition between roads are comparatively few. Boston, Worcester and Springfield have three railroads; Pittsfield, Fitchburg, Lowell and North Adams have but two. All the other central and southern New England towns of consequence have but one railroad. Evidently, therefore, the Commission took the point of view that competition was desirable and also realized that the Canadian roads could hardly be interfered with.

There are three Canadian lines in New England. One is the Canadian Pacific's Main cross-state line which is largely in the nature of a bridge, together with some feeders into the potato section of Aroostook county. The next is the Portland division of the Grand Trunk, now part of the Canadian National. This was built years ago and would be of no use to anyone else. Portland formerly was the winter port for the Grand Trunk System during Montreal's and Quebec's ice-bound season. Now the winter ports of Canada, for patriotic reasons, are St. Johns and Halifax which are about 325 and 425 miles further than Portland. However, the rates are the same, the Canadian taxpayers make good the difference and they seem to be willing to pay for their patriotism.

The Canadian National System also owns a north and south line, that is the Central Vermont, with a subsidiary extending from the Canadian border to New London, on Long Island Sound. This maintains competition in Vermont and the Upper-Connecticut Valley and is left undisturbed.

SYSTEM I comprises all the railroads in Northern

New England, excepting only the north and south division of the Rutland Railroad (which is logically allocated to the New York Central because it operates in that section of Vermont west of the Green Mountains, the trade of which is naturally tributary to New York) and the Central Vermont lines previously referred to.

There are added to this system two lines outside of Northern New England. One is the old Ogdensburg & Lake Champlain Railroad, now a part of the Rutland Railroad, which forms a connection for the Northern New England system with the Great Lakes. Before Congress passed the foolish legislation compelling railroads to rid themselves of all ownership in steamship lines, this railroad owned the Ogdensburg Transit Company which operated steamships on the Great Lakes between Ogdensburg, Cleveland, Detroit, Chicago, etc., and thus gave Boston and Northern New England a rail and water line under one management—the very thing everyone seems to be keen for just now. Sooner or later Congress is likely to sanction this once more.

The other important division outside of New England is the Delaware & Hudson which connects with the Northern New England lines at their extreme southwestern point, that is, at Mechanicville and Troy, N. Y. The D. & H. would give the Northern New England system a direct connection into the anthracite region and with every one of the proposed trunk line systems. It forms the only possible connection for that purpose.

From a legal angle there appears to be no obstacle to the creation of System I, because none of the lines included is actually controlled by any other interest, although the New York, New Haven & Hartford owns about 28 per cent of the voting stock of the Boston & Maine which, in conjunction with the rumored acquisition of a large block of B. & M. stock by the Pennroad Corporation, may actually be a controlling interest. Neither is there any obstacle to the creation of the proposed system from the financial point of view, because the Boston and Maine is now financially strong, although the strongest financial unit in the system would be the D. & H., as at present constituted, which is very rich in cash and which might possibly acquire the B. & M stock from the New Haven and thus enable Mr. Loree to be the "top dog" of this combination, provided he really likes the combination.

Public sentiment is alleged to be more or less in favor of a railroad combination of Northern New England and, therefore, with the exception of the status of the Delaware & Hudson, the effectuation of this part of the plan should be comparatively easy. Quite possibly all parties except the D. & H. might be willing to agree on arbiters to work out the respective value of the securities to be issued in the suggested merger.

SYSTEM II is practically the present New York, New Haven & Hartford with the addition of some very unimportant short lines and two bridge lines, the Lehigh & Hudson and the Lehigh & New England, plus the New York, Ontario & Western, the majority of the stock of which is already owned by the New Haven.

Shortly before the New York Central acquired the Rome, Watertown & Ogdensburg Railroad, the N. Y. O. & W. acquired running rights over that part of the R. W. & O. between Oswego and Niagara Falls, in order to enable it to compete with other trunk lines between New York and Buffalo, and, if necessary, to be a factor in the making of rates and divisions in connection with the Canadian systems. This agreement, no doubt, expired long ago but, anyway, under the present system of rate regulation by the I. C. C., this factor,

which seemed of great importance 40 years ago, exists no longer.

Will Oswego Rival Buffalo as Lake Port?

Theoretically this makes a fair line to a lake port, but as a matter of fact the O. & W. has a very steep grade at the point where it leaves the Hudson Valley at Cornwall, N. Y., and a number of other grades, since it crosses many watersheds at right angles. However, irrespective of running rights to the Niagara Frontier and connection at that point with the two big Canadian systems, the N. Y. O & W. gives the New Haven an outlet to the edge of the anthracite fields and a connection with every one of the proposed trunk line systems and an outlet to the Great Lakes at Oswego, which point is expected largely to take the place of Buffalo as the lower end of lake navigation upon the early completion of the deeper Welland Canal.

There does not seem to be any legal obstruction to the creation of this system. The New Haven, presumably, would sell its interest in the Boston & Maine although, possibly, even that may not be necessary. It now owns jointly with the New York Central the controlling interest in the Rutland Railroad and the sale of this interest can presumably be arranged at a fair price.

The only problem is the acquisition of the Lehigh & New England, now largely owned by the Lehigh Coal & Navigation Corp. (a Philadelphia enterprise) and of the Lehigh & Hudson, which is jointly owned by a number of trunk lines. The New Haven has not recently asked to acquire control of these lines; on the other hand, the trunk lines have been very eager for them. This, no doubt, is due to the fact that both of these roads are more or less bridge lines between the trunk lines and New England and any one of the trunk lines, of course, would like to control such an important connecting link. However, the Lehigh & Hudson was finally acquired jointly by the trunk lines. No doubt the reason for the New Haven's lack of desire to acquire these lines is based on a fear that it would not get a division of the through rate at the west end of these lines sufficiently greater than it now receives at the east end. On the other hand, the Commission probably—and quite properly—concluded that joint ownership and management of anything is frequently a source of friction and extravagance and should be avoided wherever possible.

Virginian Would Complement N. Y. Central

SYSTEM III consists of the present New York Central System without any subtractions, with the addition of many short lines and of the Virginian Railway. This addition appears absolutely logical because with the growth of the country and the congestion of the Port of New York, the communities adjacent to the western half of the New York Central System should have an outlet for their traffic to Hampton Roads; furthermore the Virginian is largely a coal carrier and the New York Central, considering the magnitude of its system, is not too strongly supplied with coal on its own rails for its western lines.

There appears to be no legal obstacle to the creation of this system; the only obstacle from a financial point of view is the question whether the New York Central is willing to purchase the Virginian and whether it is willing to pay a price satisfactory to the heirs of the late H. H. Rogers who are supposed to own a large majority of the capital stock of the Virginian Railroad. It is quite true that the Virginian is also desired by the Chesapeake & Ohio and by the Norfolk

& Western, with both of which it is strongly competitive as to the huge coal traffic carried by it. The C. & O. officers claim that presently undeveloped coal territory tributary to its and the Virginian's lines could be more cheaply developed by its ownership of the Virginian, because in further development the Virginian must reach the various coal fields of southern West Virginia by expensive lines with steep grades, while the C. & O. could develop this particular territory by pushing up spurs from its main line along the New River up a water grade along the various creeks. The Commission is already on record as denying lease or merger of the Virginian with the Norfolk & Western because it would result in the elimination of competition. Presumably for the same reason it would object to a merger with the Chesapeake & Ohio.

SYSTEM IV consists of the present Pennsylvania Railroad with practically no additions, other than short lines, but many subtractions, the most important of which is control of the Norfolk & Western.

Should the N. & W. Continue in P. R. R. Control?

About 25 years ago the Pennsylvania Railroad commenced buying stock of the connecting Norfolk & Western and has since acquired a majority of the capital stock of this very important and now prosperous carrier. The Norfolk & Western feeds into the P. R. R. at three principal points. In the east it turns over a large volume of traffic destined to northeastern points over its Shenandoah Valley Division to the P. R. R. at Hagerstown. It reaches Columbus, the very center of Ohio, on a watergrade from the Ohio River along the Sciota Valley. At Columbus it turns over to the Pennsylvania a large coal tonnage destined to the Upper-Lake ports and the industrial cities on the Lower Lakes—Cleveland, Toledo, Detroit, Chicago, etc. Similarly, at Cincinnati it turns over to the Pennsylvania a substantial tonnage for other points not as advantageously reached via Columbus. The loss of this tonnage would be felt considerably, even by the big Pennsylvania Railroad System. The connection between the Norfolk & Western and the Pennsylvania Railroad is natural and logical. It is quite a serious question whether any retroactive legislation could abrogate this status, and the 1920 law says that the existing routes of traffic shall be preserved.

Commissioner Eastman says:

Either the Clayton Act or the Sherman Anti-Trust Act should be used to pry these two roads apart. They are, it seems to me, clearly competitive. The Norfolk & Western's Hagerstown route competes with the Pennsylvania on north and south traffic and has very important potential possibilities in this direction which have not been developed. The coal traffic of the Norfolk & Western from the southern fields is also intensively competitive with the coal traffic of the Pennsylvania from the northern fields, as was amply demonstrated in the Lake Cargo Case, to say nothing of the competition on export and import traffic through Norfolk as compared with similar traffic through the Pennsylvania's ports.

This will raise the question of whether the two roads are strictly competitive. On north and south traffic the Pennsylvania gets substantially as long a haul from Hagerstown as it would from Washington over its principal north and south route or almost as long a haul as it would get from Cape Charles opposite Norfolk. The Hagerstown and Cape Charles gateways are very remotely competitive. When it comes to coal traffic, it might be considered that all roads touching a coal region are more or less competitive. It would appear to be a question of whether the fact that the lines are supplementary to each other would not over-balance the competitive feature.

The allocation of the Norfolk & Western to the proposed Greater Wabash System will be referred to later on in connection with the proposed Greater Wabash System.

The Pennsylvania Railroad dominates in two different ways a number of other railroads which are supposed to become part of other systems. The Pennsylvania Company is a wholly owned subsidiary corporation of the P. R. R. and was formerly used as a vehicle to control the lines west of Pittsburgh. These latter roads, however, are now leased directly to the Pennsylvania Railroad and the Pennsylvania Company is merely a holding company which owns nearly one-half of the capital stock of the Wabash and of the Lehigh Valley. These two roads, under the plan, are supposed to form the backbone of a new trunk line system, independent of the Pennsylvania Railroad.

The Status of Pennroad and Penna. Company

The Commission has brought proceedings under the Clayton Act in an effort to make the P. R. R. disgorge this ownership. Undoubtedly it will finally be up to the Supreme Court to pass on the question.

There is another corporation which in no way can be called a subsidiary of the P. R. R. although it is clearly affiliated with, and dominated by it. This is the Pennroad Corporation which was formed early in 1929 with 5,800,000 shares of stock of no par value; each stockholder of the P. R. R. had the right to buy this stock at \$15 per share. All the stock of the Pennroad Corporation is tied up in a voting trust, the voting trustees being directors of the Pennsylvania Railroad. The president of the Pennroad Corporation is a former vice-president of the Pennsylvania Railroad.

Whether this Pennroad Corporation can do legally what the Pennsylvania Railroad is not allowed to do is another question which will be up to the Supreme Court. The Pennroad Corporation which has since increased its capital stock to about 9 million shares has also purchased the Detroit, Toledo & Ironton from Henry Ford. This railroad, outside of tonnage given it by the Ford interests, is not an important traffic factor. Under the consolidation plan it has been allocated, to the extent of a one-half interest each, to the Baltimore & Ohio and Wabash Systems. It has also been stated that the Pennroad owns a controlling interest in the Pittsburgh & West Virginia, an important competitor in the Pittsburgh district and a parallel line which is desired by the Van Sweringens. Under the consolidation plan this line forms the very heart of the proposed Wabash System, hereinafter referred to.

The Pennroad Corporation is also reported to have acquired the Canton Railroad, an important terminal railroad in Baltimore which, under the plan, is to be considered a terminal railroad with its line open to all connections on equal terms. Likewise, the Pennroad is reported to have purchased substantial blocks of other railroad stocks, such as Boston & Maine, New Haven, etc.

As far as trimming down the Pennsylvania and its interests to the limits of the proposed System IV is concerned, there are the above serious legal obstacles which might be classed under three different heads:

- 1—Purchase before the present act
- 2—Purchase by a wholly owned subsidiary
- 3—Purchase by an affiliated company.

The legal questions undoubtedly differ in each case and no settlement is likely except after a decree of the Supreme Court.

From a practical angle the question of price of the

shares of the various companies controlled by the Pennsylvania Railroad interests is probably of minor importance because if the courts should hold that the stock of any particular company has been illegally acquired, and must be sold, they will undoubtedly also decree the method of selling it, as was done in the case of the segregation of the Southern Pacific and Union Pacific and of the Philadelphia & Reading Coal Company from the Reading Railroad. If, for example, there should be but one buyer for one of the lines which the courts might order to be sold, for instance, the Pittsburgh & West Virginia, then the price for the stock of this company would presumably have to be left to arbitration.

Allocation of Alton Raises Questions

SYSTEM V, the Baltimore & Ohio, is re-shaped quite considerably. The company is expected to give up its control of the Western Maryland. In addition to a number of short lines, there is allotted to it the Buffalo, Rochester & Pittsburgh and the Buffalo & Susquehanna, thus strengthening it to the north of Pittsburgh; also the two extremely important railroads, the Reading and the Jersey Central; one-half interest in the Detroit, Toledo & Ironton, which is now controlled by the Pennroad Corporation, and the one-half interest in the Detroit & Toledo Shore Line, now owned by the Canadian National. In addition, there is the rather curious allotment to it of the Chicago & Alton in lieu of the Wabash which the B. & O. desired. The only similarity between the Wabash and Chicago & Alton is that they both run to Chicago, St. Louis and Kansas City. The points of dissimilarity are very great. The Wabash is an important carrier in the states of Ohio, Indiana and Michigan, which are not reached by the Chicago & Alton; it has excellent terminals in Detroit and other cities and its main line from Detroit and Toledo to Kansas City runs through a succession of important manufacturing towns which would give much business to the B. & O. System. There are located along the Wabash main line the towns of Fort Wayne, Peru, Wabash, Logansport, Lafayette, Danville, Decatur, Springfield and Jacksonville, etc., etc.

There is also allocated to the B. & O. one-half interest in the Chicago, Indianapolis & Louisville which, somehow, the Louisville & Nashville and Southern Railway systems are expected to surrender.

From a financial angle the B. & O.'s credit is strong enough to take over these companies at fair terms. The acquisition of the Reading and the Jersey Central, from a practical angle, depends on the co-operation of the New York Central. At present, the Reading, which owns over 80 per cent of the Jersey Central, is controlled jointly by the B. & O. and New York Central which between them own a majority of the stock and dominate the board of directors. Undoubtedly the New York Central would want ample protection for access to Philadelphia over the Reading tracks and for the use of the extremely important terminals of the Jersey Central on the New York harbor front.

Interwoven with the acquisition of the Reading is also the development of a new New York-Chicago through line which would be considerably shorter than any route now existing. Such a route would involve the construction of very little new mileage, but the lease and improvement of parts of either or both of the Philadelphia & Erie Division of the P. R. R. and the Beech Creek Division of the New York Central. Such a new through route via the Jersey Central and Reading would fit into both the New York Central and B. & O.

systems; although the latter needs it much more. Shall there be two such routes or one? It is not at all unlikely that the B. & O. and New York Central can agree on this.

Would the C. N. R. Part With Shore Line?

As to the other allotments, the Canadian National is not likely to part with its one-half interest in the Detroit & Toledo Shore Line which is not only very profitable but gives the Canadian National very valuable connections at Toledo, besides securing a large amount of coal hauled for its own consumption. The acquisition of one-half interest in the Detroit, Toledo & Iron- ton would have to await the adjudication of the Supreme Court on the status of the Pennroad Corporation.

As for the Chicago & Alton, this property is in the hands of the receiver. Undoubtedly the bondholders' committee will deal with it to its best advantage—that is, it is probably for sale to the highest bidder, provided the bid is sufficiently high to induce the security holders to sell rather than to operate the property.

This allocation of the Chicago & Alton brings up another very interesting question. The eastern systems have been desirous of acquiring the Chicago-St. Louis lines while some of the roads running from the southwest to St. Louis would appear to be in need of a Chicago connection in order to compete on even terms with systems like the Rock Island and Santa Fe which run directly to Chicago.

There are four railroads between Chicago and St. Louis; two of them form parts of larger systems and therefore are part of bigger problems. They are the Illinois Central and the Wabash. On the other hand, the other two roads, the Chicago & Alton and Chicago & Eastern Illinois may be considered as strictly appertaining to this particular territory although both also reach other territories. It would seem as though both should either go to eastern lines or both to western lines. It appears as though the Commission has straddled this question by allocating the Chicago & Alton to an eastern line and the Chicago & Eastern Illinois to a western line which probably does not want it.

The Baltimore & Ohio System as outlined under the plan is reasonably certain never to become a full reality but will probably expand in the east in accordance with the plan.

SYSTEM VI appertains to the Van Sweringen combination and allows this group substantially everything asked for, excepting only the Wheeling & Lake Erie which they control tentatively through the Alleghany Corporation, an affiliated holding company, and the Pittsburgh & West Virginia, which has been acquired by the Pennroad Corporation.

Realizing that every important eastern trunk line system must reach Pittsburgh, there has been allocated to this system the Bessemer & Lake Erie, running from Pittsburgh to Lake Erie. This road is owned by the U. S. Steel Corporation and handles a very heavy traffic for it.

D. L. & W. Assignment Should Please C. & O.

An extremely important line allotted to this system is the Delaware, Lackawanna & Western, supposed to be controlled through a majority of stock ownership by the George F. Baker interests, who are generally presumed to be somewhat interested with the Van Sweringens. This plan makes a very strong Van Sweringen System because it finally permits merger of the Nickel Plate-Erie-Pere Marquette and Chesapeake & Ohio sys-

tems. It takes away the Chesapeake & Ohio of Indiana, which is allotted to the Wabash System as a connection for the Norfolk & Western into Chicago. For reasons stated in the analysis of System VII, the C. & O. undoubtedly would be delighted to part with this particular division.

SYSTEM VII, the Wabash, is a most interesting suggestion for a system, inasmuch as it would extend from Omaha and Kansas City, to New York, Philadelphia, Baltimore and Hampton Roads, and clear down to the southern tip of Florida, covering even more territory than the Illinois Central System which extends from South Dakota to Georgia.

The suggestion to merge the Seaboard and Norfolk & Western with the Wabash and Lehigh Valley is rather startling to the imagination, especially as every part of this proposed system, except the Seaboard Air Line, is now controlled by adverse interests, including the Wabash itself.

Like many other combinations, from a traffic point of view, there certainly is no serious objection to the proposed combination of the Wabash, the Lehigh Valley, the Pittsburgh & West Virginia, the Wheeling & Lake Erie and the Western Maryland, although to couple this up with the Norfolk & Western seems unsound, because the Wabash System cannot be considered an efficient outlet for either the eastern or western part of the Norfolk & Western.

The most economic route for the Norfolk & Western coal to the lakes is, as previously pointed out, via the water grades from the coal region to Central Ohio. As it is, the Norfolk & Western follows water grades from the coal fields down to the Ohio River, along the Ohio River and then through the valley of the Scioto into Central Ohio. The Norfolk & Western's line from Portsmouth, Ohio, to Cincinnati, is not as good because it runs through a hilly country. Cincinnati itself is extremely congested and the C. & O. of Indiana which is supposed to form part of the Wabash as a coal road is impossible. It rises out of the Ohio Valley on a 2 per cent non-compensated grade and crosses Indiana at a poor topographical location. If this were a feasible coal road, the C. & O. itself would have used it instead of having gone to the enormous expense of acquiring the Hocking Valley.

The Seaboard Air Line is quite a different proposition from any of the lines mentioned above. It is a typical southern road with a heavy refrigerator traffic moving from Florida to points north. It is proposed to strengthen it in connection with the Norfolk & Western by allocating to it the Piedmont & Northern which would have to bridge several gaps to a connection with the Norfolk & Western at the most convenient point, that is, Winston-Salem.

Proposed Wabash System a "Phantom"

From a financial point of view it would seem as though the Wabash, in connection with the Lehigh Valley, could finance this system without counting on the Norfolk & Western and the Seaboard. The Norfolk & Western is financially, by far, the strongest of this group and could easily carry the Seaboard.

Looking at this system from a legal angle and at the widespread of it above referred to, one wonders who was the Jules Verne who conceived it! As the matter stands it is a phantom. Every essential part of importance has to be pried loose from adverse interests. It is not impossible that we may see a greater Wabash System, and that it will not take as long to realize as it did Jules Verne's "Twenty Thousand Leagues Under

The Sea." The real start toward it is not likely for several years to come.

SYSTEM VIII consists of the Atlantic Coast Line-Louisville & Nashville just as they stand. The only subtraction is the suggested sale of one-half of the system's one-half interest in the Chicago, Indianapolis & Louisville to the B. & O., and additions are the acquisition of the Gulf, Mobile & Northern and the New Orleans Great Northern; also the Savannah & Atlanta Railroad. The predecessor of the Gulf, Mobile & Northern, over 15 years ago, was owned jointly by the Louisville & Nashville and the Frisco.

The Gulf, Mobile & Northern has just acquired the N. O. G. N. and has been strengthening itself in various ways in order to be an effective competitor for business from New Orleans to the north. This competition is mostly with the Illinois Central, although it does compete to some extent with the Louisville & Nashville. Whether the G. M. & N. might not have better fitted into the Frisco-Rock Island combination is, of course, open to discussion.

There are three important main line railroads in the South with comparatively short mileage which are not mentioned in the plan but which, presumably, will go to the Coast Line-L. & N. combination. They are the Georgia Railroad, Atlanta & West Point and the Western Railroad of Alabama. The Savannah & Atlanta is the logical connection of the Georgia Railroad into Savannah. There is no difficulty whatever in the set-up of this system from the financial angle and none from the legal angle.

SYSTEM IX is the present Southern Railway System without the Mobile & Ohio. Besides many connecting lines there are several important additions to it which are intended to increase the company's territory in North Carolina, as well as to develop its Florida business. In North Carolina, the Norfolk & Southern of about 800 miles is allocated to it. The competition of this system with the Southern is not important, as it occupies entirely territory to the east of the Southern Railway's main line. However, much of its profitable tobacco traffic comes from some of its present large stockholders; the continuity of this could not be depended upon in case of a change of ownership.

It has been the policy of the present management of the Southern Railway to keep out of Florida. Its only mileage in Florida is the Georgia, Southern & Florida which runs from Macon, Georgia to Jacksonville, Florida, with a 130 mile branch to Palatka, a point about 40 miles south of Jacksonville. If the Southern Railway's management should desire to change its policy the allocation to it of the Florida East Coast Railroad and of the Georgia & Florida Railroad, would undoubtedly give it an extremely strong position in the eastern half of Florida. The G. S. & F.'s Palatka branch could be used as a cutoff for the Florida East Coast's traffic to the west without passing through Jacksonville.

The Georgia & Florida which at present has no prospects for business at its southern end, could, after expenditure of a very large amount of money, be made part of an overflow through line by diverting north-bound traffic through Augusta to the Southern Railway's main line at Greenville, S. C. This business would be taken away from the Columbia, Savannah & Jacksonville Division of the Southern Railway, but over one-half of this division's mileage is over track leased from the Atlantic Coast Line.

The Mobile & Ohio is not particularly necessary to

the Southern Railway System and presumably the Southern would be willing to part with it on fair terms. Attempts have been made to upset control of the M. & O. acquired in 1901 by the Southern. For a number of years the Southern lost money on this road. Now that it has become profitable, some of the holders of Mobile & Ohio 4 per cent stock trust certificates, with dividends guaranteed by the Southern, would like to have the actual Mobile & Ohio stock returned to them and suit for this purpose is pending. If the Southern disposes of the Mobile & Ohio, it is much more likely that it will be done on fair terms commensurate with the earning capacity of the property.

Difficulties Foreseen in F. E. C. Acquisition

The Georgia & Florida can undoubtedly be acquired cheaply, but it would be difficult for any one to arrive at a conclusion as to what is the fair value of the stock equity, if any, in the Florida East Coast Railroad. This company greatly increased its bonded debt during the Florida boom in order to double-track its main line. Its property is in excellent shape; it can handle business most economically; it could undoubtedly earn its heavy interest charges and make money for its stockholders if only it had three or four times the volume of traffic it now enjoys. The gross earnings have been cut in two. The management has been extremely successful in reducing expenses, but the increased fixed charges incurred during the boom are grossly out of proportion to the present volume of business.

Assuming the Southern Railway is willing to buy the Florida East Coast, even by discounting the future of Florida for several years ahead, will the present successors of the late H. M. Flagler be willing to sell their stock at a price commensurate with this situation? At present, their investment represents a liability rather than an asset.

From a legal angle there seems no difficulty about this system whatsoever.

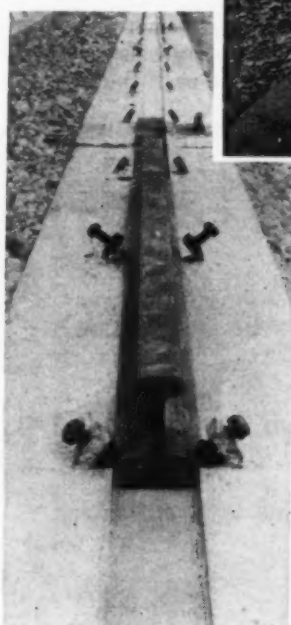
(In the second and concluding part of this article, which will appear in next week's *Railway Age*, Mr. Lisman will discuss the proposed Illinois Central System and the projected systems in Western territory, together with a consideration of the recommendations regarding terminal properties and an evaluation of the plan in general—EDITOR.)

* * *



A Boston & Albany Local at Newton Centre, Mass.

Details of the New
Rail Fastening



Looking at the New
Roadbed Construction
from the End of the
Original Installation

Pere Marquette Builds New Type of Concrete Roadbed

*Extension of original installation
embodies some distinctive features*

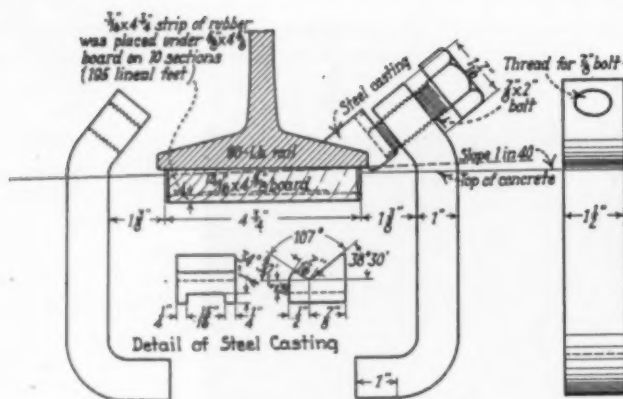
THREE years ago the Pere Marquette completed and placed in service a quarter-mile of concrete roadbed at Beech, Mich., in the westbound track of its double-track line between Detroit and Plymouth, for the purpose of studying the behavior of this rigid form of track support. This construction, as described in the *Railway Age* of December 12, 1925, January 8, 1927, and January 14, 1928, consists essentially of reinforced concrete slabs nearly rectangular in section which carry the rails without any special provision for either insulation or cushion. One of the rails rests directly on the concrete while the other is separated from the concrete only by thin insulating fiber. Periodic inspections during the three years of service have disclosed no evidence of a crushing or shattering of the concrete under the impact of traffic, or of abnormal rail wear. There is, therefore, no reason to question the soundness of the basic idea of a rigid track support. However, it has become apparent that there was opportunity to improve the rail fastening, and for the purpose of ascertaining the merits of a new form of rail fastening and of determining the opportunities for greater economy in design, the experiment has been amplified by the construction of a 400-ft. extension of the original installation embodying some rather marked changes in design. This new unit was recently placed in service.

The second installation consists of 20 units, each 19 ft. 6 in. long and 9 ft. wide, or 1 ft. narrower than those of the earlier installation. The new construction embodies a departure from the first in that it employs the structural elements of an inverted slab-and-girder floor

instead of the simple rectangular slab. The slab rests upon the subgrade to distribute the load and the up-turned girders carry the rails. Something new in the way of rail fastenings is also used on the new installation and the rails are separated from the concrete to provide both a cushion and insulation.

By using the inverted slab-and-girder form of construction the amount of concrete and, therefore, the weight of the construction per track foot has been materially reduced. An important consideration leading to the adoption of a lighter design was the influence of weight on construction. Realizing that the difficulty of constructing a concrete roadbed under tracks needed for traffic should be mitigated as much as possible, the new slabs were designed with the idea that they could be manufactured in a plant, shipped to the site and placed by handling equipment. Construction could then proceed rapidly and traffic turned over the newly equipped track immediately on completion of the work.

Another consideration that appeared important to the designers is the certainty that under certain conditions the slabs will be subject to settlement during a period of roadbed solidification, with the result that uneven surface may develop. The smaller weight of the new slabs makes it possible to lift them with ordinary jacks; and experiments have already been carried out that demonstrate the practicability of rebedding slabs that have been raised to restore them to uniform surface. A layer of fairly dry sand can be blown under the slabs with cement guns to form a compact and uniform base. Settlement in the case of the initial installation has been



How the Rail is Held in Place

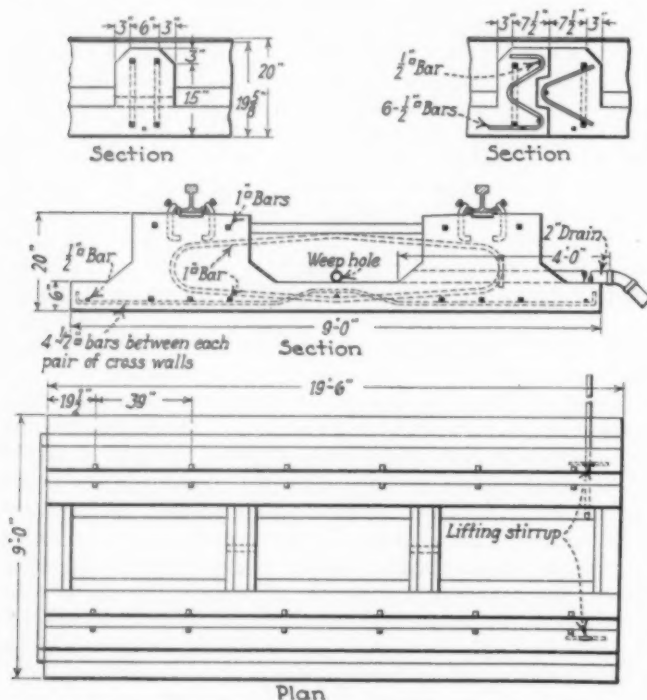
remarkably uniform and it has been unnecessary to make any adjustment of the surface.

The New Design

The theory of the new design is that the slab will distribute the load and the longitudinal girders will furnish strength to take longitudinal bending moments. The necessary transverse strength is provided for by reinforcement in the slab and by transverse beams or diaphragms tied by reinforcement to the longitudinal girders and the slab. The upper edges of the diaphragms are beveled and the pockets between them are filled with ballast to minimize the effect of derailed wheels and to deaden sound.

A tongue-and-groove joint formed with a metal dam faced with 1/4-in. elastite was used to connect the ends of slabs of the first concrete roadbed. This joint functioned so well that it was adopted for the new design. Observation of the joints during the passage of trains proved that they transfer shear at the ends of slabs and, to a degree at least, maintain uniformity of pressure on the subgrade.

The longitudinal girders or rail supports, 20 in. deep, are only one inch less in depth than the slab of the previous design and, with the diaphragms, are reinforced against bending in two directions. The six one-inch



General Details of the New Roadbed Construction

square bars in the bottom of the slab under the girders afford approximately the same area of reinforcement as was provided in the original design. Lifting stirrups are provided in one end of each slab to provide for connecting a jacking beam in case the slabs ever require jacking up to restore surface.

A New Rail Fastening

The details of the rail fastening are such as to allow adjustment in alignment of the rails with a high degree of accuracy. The principle employed is that of opposing screws, like the azimuth setting of the old Gurley transits. When one screw is slacked off, the opposite one is screwed in, thus keeping pressure at all times against the edges of the rail base. Contact with the rails is made by means of small steel castings with a V-groove to fit over the edge of the rail flanges. The top portion of this casting in contact with the screws is



A Construction View

rounded, so that as adjustment is made by the process of tightening and slacking the screws, the pressure of the screws on the casting will remain practically radial.

What will happen to the rail fastenings if equipment is derailed on this track is a question that cannot be answered definitely. Derailed wheels usually work away from the rails promptly. Irreparable damage to a single rail fastening would not require renewal of it, but new anchors can be put in by the process of drilling and "stone bolting."

Rail Seat Is Cushioned

The opinion is held quite generally that a cushion between the rails and a rigid support is necessary to prevent destruction of the support, the equipment, or both. Whether this opinion is the psychological reflex from familiarity only with a "flexible" track is not yet proved. The first installation by the Pere Marquette is, without question, a rigid construction and after three years there is little evidence of the destructive effects of rigidity. However, the problem of insulation had to be met and it was thought worth while to experiment with cushioning material that could serve also as insulation. Accordingly the track girders were grooved to hold a cushioning and insulating pad under the rails. For 10 of the slabs, this pad consists of a 3/16-in. by 4 3/4-in. strip of rubber with a 5/8-in. by 4 5/8-in. creosoted wood board over it. On the other 10 slabs, the pad consists of a 3/4-in. by 4 5/8-in. creosoted board without the rubber strip. These pads not only insulate the base of the rail

from the concrete but provide something compressible that will keep the fastenings tight.

Construction

As in the case of the earlier work, the presence of a passing track simplified construction. The westbound track was taken out of service by cutting it at the west end of the new work, and at the east end of the old stretch of concrete roadbed, and throwing it over to effect connections with the eastbound track, eastbound trains using the passing track. While the slabs were so designed that they could have been precast in a plant, the extent of the installation did not warrant plant manufacture and the roadbed was cast in place. The concrete was designed for a strength of 4,000 lb. per sq. in. at 28 days on the basis of the water-cement ratio relation to strength, and cylinders made from the concrete (two for each slab) gave test results well above that figure. The finished work was covered with damp sand and loam for curing while the test cylinders were cured in damp sand until shipped to the laboratory where they were cured in a moist room until 48 hours before testing.

Preparation of the subgrade was accomplished by removing the track and shoveling off the ballast to the proper elevation. The subgrade was not consolidated.

Forms were built in sections at the Pere Marquette shops in Grand Rapids prior to commencing construction. Five sets of forms were provided and after reusing as required for the 20 slabs, forms for 4½ slabs were still in good condition.

The forms were supported from cross pieces spiked to two-inch by four-inch stakes driven into the subgrade at the sides of the roadbed. Since the accuracy of the groove in the rail girders would govern the surface and, to a certain extent, the alinement of the rails, considerable care was taken to get this groove accurate not only as to line and surface but as to cant as well. It was also necessary to hold the anchors firmly in correct position while the concrete was being cast. These objectives were accomplished by using a sized 4¾-in. by 5-in. timber set to line with its bottom forming the groove. This timber was set with transit and level and spiked to the cross pieces. Various schemes were employed to obtain a perfect groove bottom but none was entirely successful in eliminating air bubbles.

The aggregate was stocked at the site and water for the concrete mix and for curing was obtained from a locomotive tank on a temporary siding. The time required for the concrete work from the casting of the first slab to the completion of the last one was approximately three weeks. The crew was small and some delay was occasioned in setting the groove form piece.

* * *



On the New York, Ontario & Western at Middletown, N.Y.

Southern Railway Opposes Barge Line's Application

WASHINGTON, D. C.

ASSERTING that there is not the slightest doubt that the Interstate Commerce Commission would promptly deny an application for a certificate of public convenience and necessity to construct a new all-rail line from Cincinnati to New Orleans, the Southern has filed with the commission some "comments" on the application filed last August by the Mississippi Valley Barge Line for a certificate authorizing it to operate on the Ohio and Mississippi rivers and for the establishment of through routes and joint rail and barge rates. The Southern declares that neither the present nor future public convenience and necessity require the operation of the proposed water line; that it would open up no new territory and create no new traffic but that its operation would injure the rail lines because it would depend on tonnage it would take away from the Southern and other rail carriers.

"There is no more need for a new water line than there would be for a new all-rail line," the Southern says. "The proposed water line would mean a duplication of facilities and service which have been demonstrated to be adequate, to the probable injury of existing rail carriers and, in our opinion, without any real compensating benefits to the public. We submit, therefore, that the application of the Mississippi Valley Barge Line Company should be denied."

The statement points out that there are numerous rail lines serving the territory adequately and efficiently, that are not only handling promptly all traffic now being offered, but need greatly increased tonnage which they could move without placing any burden on existing facilities, and says that if the application is granted the differentials under the all-rail routes should be much less than those sought by the applicant, because such differentials, if established, would result in applicant having a complete monopoly, to the exclusion of the all-rail routes, with respect to all traffic which it desired and had available vessels to transport. The Southern says it understands that the barge line company seeks the application of a formula for constructing differential rates between central territory and the Southeast and Southwest which will result in some instances in lower barge-rail and rail-barge rates than now apply in connection with the government barge line on the Mississippi.

Reference is made to an estimate in a report of the House committee on interstate and foreign commerce on the Inland Waterways Corporation in the Seventieth Congress that there are 30,000,000 tons of traffic available for movement on the Mississippi, Illinois and Missouri rivers, if facilities were available, and it is asserted that the movement of this amount of traffic by water would mean a loss in gross revenues to the rail carriers of not less than \$150,000,000 a year, a large part of which would fall on the carriers operating east of the Mississippi and south of the Ohio.

"Under a system of differential rates which gives a water-rail route a differential rate at present 20 per cent under the all-rail routes, the all-rail routes cannot compete as to a large and important moving traffic; the water line will receive all the traffic it can handle," the Southern continues. "For example, differentials amounting to \$48 per car on canned goods, \$36 per car on soap, \$39 per car on agricultural implements, \$60 per car on special iron, \$50 per car on sugar, \$33 per

car on coffee, \$40.60 on sisal, and 52½ cents per bale on cotton, will turn as much of this traffic to the barge line as they are able to move. The same situation obtains as to various other commodities and also as to miscellaneous articles.

"In the absence of convincing proof that the economy of transportation in connection with barge lines justifies differential rates approximately 20 per cent lower than the corresponding all-rail rates such differential rates should not be prescribed.

"There are those who contend that the movement of traffic barge-and-rail at rates 20 per cent less than the corresponding rail rates results in a great saving to the shipping interests and consequent benefit to the public. We question the correctness of this contention.

"The transportation service on which the public is principally dependent, and on which it must continue principally to rely, is furnished by the railroads. Literally thousands of communities are reached and served by rail carriers, while the water carriers serve comparatively few points. It is not in the public interest to deplete the earnings of the rail carriers to an extent which will render them unable to furnish prompt and efficient service to the public, so that those shippers who are in a position to take advantage of the differential water-and-rail rates may effect a saving in transportation charges on their particular traffic."

The Southern also points out that the lines operating in the Southern district in 1928 had a rate of return on property investment of only 4.14 per cent, or less than that of any other group except the Northwestern group, and that in the first eleven months of 1929 the rate of return of the carriers in the Southern region was even less favorable, declining to 4.07 per cent.

The barge line company proposes a bi-weekly service from Cincinnati to New Orleans, making the 1482 miles in six days, and has let contracts for 5 towboats of 1,600 horsepower and 50 barges of 300 tons capacity. It estimates that it will be able to transport with its initial facilities 3,000 tons of traffic per week, or 156,000 a year. On the basis that the revenue of the government barge line on the Mississippi is approximately \$4 a ton and that this is about 80 per cent of the rail rates, or \$5 a ton, the Southern says that it and the other rail lines would thus be deprived of \$780,000 a year in revenues. The barge line proposals, it says, would result in differentials under all-rail rates between New Orleans and such points as Dayton, Columbus, Cleveland, Pittsburgh, Indianapolis and Chicago, ranging from 15 cents on sixth-class freight up to 38 cents on first-class.

The Southern also gives examples to show how much longer the river route would be than the rail routes. For instance, from Detroit to New Orleans the rail distance is 1079 miles, as against a rail-barge distance through Cincinnati of 1735 miles.

TWENTY OR MORE PERSONS killed is the record of a train wreck reported, in press dispatches of January 7, as having occurred between Tunis and Algeria, Africa. The derailment occurred on a high bridge and two coaches fell to the ravine below.

THE CASCADE TUNNEL of the Great Northern completed the first year of its existence on January 12. Exclusive of work trains, 110,186 freight cars were moved through the tunnel during the year, of which 54,249 were eastbound and 55,937 were westbound. In addition, 3,008 passenger trains, including mail, express and silk trains, of which 1,514 were eastbound and 1,494 westbound, used the tunnel.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended January 11 amounted to 863,191 cars, a decrease of 51,247 cars as compared with the corresponding week of last year and of 44,110 cars as compared with 1928. Reductions as compared with the corresponding week of last year were reported as to all classes of commodities, the largest decreases being in coal and miscellaneous freight, while coal was the only classification to show an increase as compared with 1928. The Pocahontas region showed an increase as compared with both years but all other districts showed decreases as compared with both years. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

| Revenue Freight Car Loading | | | |
|---------------------------------------|-----------|-----------|-----------|
| Week Ended Saturday, January 11, 1930 | | | |
| Districts | 1930 | 1929 | 1928 |
| Western | 192,237 | 210,416 | 201,241 |
| Allegheny | 173,857 | 185,961 | 180,581 |
| Pocahontas | 59,677 | 57,935 | 53,940 |
| Southern | 136,266 | 139,946 | 144,826 |
| Northwestern | 101,417 | 103,990 | 113,972 |
| Central Western | 129,020 | 140,974 | 138,968 |
| Southwestern | 70,717 | 75,216 | 73,773 |
| Total Western Districts | 301,154 | 320,180 | 326,713 |
| Total All Roads | 863,191 | 914,438 | 907,301 |
| Commodities | | | |
| Grain and Grain Products | 39,483 | 44,114 | 48,751 |
| Live Stock | 29,700 | 32,011 | 32,389 |
| Coal | 200,159 | 213,541 | 191,228 |
| Coke | 10,534 | 11,691 | 11,069 |
| Forest Products | 49,274 | 53,939 | 59,704 |
| Ore | 9,120 | 9,724 | 9,330 |
| Merchandise L.C.L. | 227,795 | 234,885 | 240,087 |
| Miscellaneous | 297,126 | 314,533 | 314,743 |
| January 11 | 863,191 | 914,438 | 907,301 |
| January 4 | 776,259 | 798,682 | 754,247 |
| December 28 | | 638,445 | 667,974 |
| December 21 | | 842,483 | 900,620 |
| December 14 | | 923,240 | 963,668 |
| Cumulative totals, 2 weeks | 1,639,450 | 1,713,120 | 1,661,548 |

Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended January 11 totaled 51,749 cars, an increase over the previous week of 7,439 cars and a decrease of 5,353 cars from the same week last year.

| | Total Cars Loaded | Total Cars Rec'd from Connections |
|------------------------------|-------------------|-----------------------------------|
| Total for Canada | | |
| January 11, 1930 | 51,749 | 32,639 |
| January 4, 1930 | 44,310 | 31,247 |
| December 28, 1929 | 41,504 | 31,817 |
| January 12, 1929 | 57,102 | 36,130 |
| Cumulative Totals for Canada | | |
| January 11, 1930 | 96,059 | 63,886 |
| January 12, 1929 | 103,208 | 66,944 |
| January 14, 1928 | 118,288 | 66,421 |

* * *



Station Platforms and Yards at Stralsund, Germany
The first car at the left of the picture, part of a Stockholm-Berlin express, is the private car of King Gustavus V of Sweden, who is the fifth figure from the left.

Distinctive Dining Cars Acquired By the Union Pacific

Five Pullman-built cars embody new principles in interior trim, decoration and equipment

THE Union Pacific, during December, received five dining cars built by the Pullman Car & Manufacturing Corp., in which entirely new principles of interior steel trim and finish were employed. The cars are constructed of steel throughout, including the interior finish, have clerestory roofs and end diaphragms without platforms. The trucks are of the six-wheel type, having Commonwealth cast-steel frames with integral pedestals, Simplex clasp brakes and Standard rolled-steel wheels.

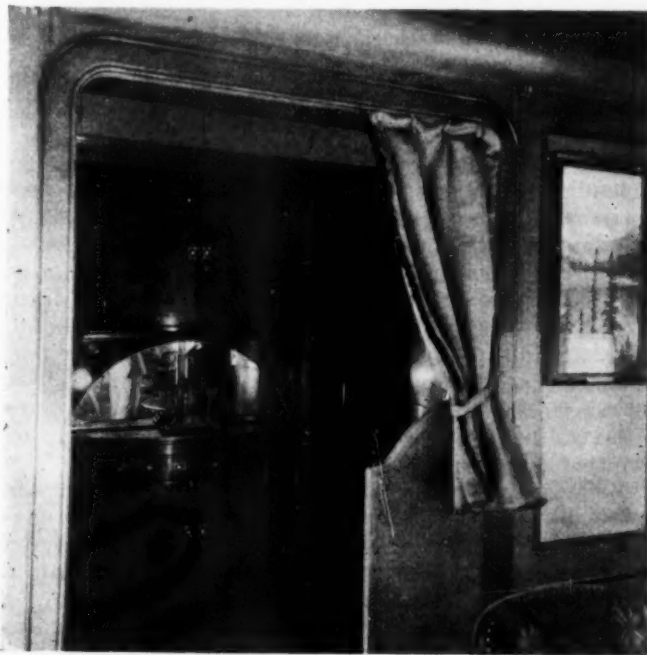
The cars are 82 ft. 11½ in. over buffers. The dining room is 38 ft. 9 in. long and is provided with six tables, each seating four people, and six tables, each seating two people, giving a total seating capacity of 36. The kitchen is 19 ft. 7 in. and the pantry 8 ft. 10 in. long. At the steward's end of the car is a 6-ft. compartment containing a refrigerator, crew's locker, etc.

The windows throughout the car are 4 ft. 3 in. wide and have double glass. The outside and inside panes of polished plate glass are mounted in aluminum bottom rails, which carry the combined locks and lifts. The glass tracks in felt runways at the sides, and the top and bottom of the window are weatherproofed by felt packing. This window construction provides maximum vision, and is weather, dust and rattle-proof, features which are very necessary in a dining car.

The heating apparatus is the Vapor system. Automatic heat control is provided, two thermostats being placed in the dining room and one in the passageway,

thus insuring a uniform temperature throughout the car. An extra amount of radiating surface is installed, especially at the ends of the car, in order to insure against cold zones at these points.

Proper ventilation is secured by an ample number of induced-draft deck ventilators. There are five elec-



The Sideboard is of Walnut with Bakelite Top and Ivory Lines for Contrast



Interior of the New Union Pacific Diner Looking Toward the Sideboard Lobby

tric paddle ceiling fans in the dining room, and two electric exhaust fans in the kitchen and one in the pantry.

The arrangement of the kitchen and pantry is the same as in the last Union Pacific cars, but the refrigerator, lockers, etc., were rearranged in the steward's lobby. The arrangement of the switchboard, linen lockers and water fountain, in the vicinity of the sideboard, was modified.

Interior Finish and Color Scheme

The cars were planned without particular regard for previous standard interior designs. Since steel was to be used throughout, it was decided not to utilize the ornaments or mouldings formerly employed, which was more adaptable to wood trim. The typical deck cornices, for example, are eliminated. In these cars, the members joining one surface with another are of rolled or formed steel, consistent with the part that each member plays in the plan as a whole.

The trim surrounding the doors and windows is of



Fully-Equipped Steward's Lobby Occupies Six Feet in One End of the Car

well modelled form with no sharp corners, the design depending entirely upon coloring, form and good proportions.

In entering the cars, either through the passageway or steward's lobby, the first impression is of an interior rich and warm in coloring, not greatly different from recent lounge cars. The walls of the passageway and lobby are finished in a light almond brown, a color that seems to expand the width of the passageway. These foyers to the principal compartment are studied compositions of simplicity. The hardware used is of oxidized silver, and the floor is covered with a rubber tile in a combination of brown and black. At the outset, it is seen that these passageways are but incidental to the central room, forming a transition from the other cars in the train by a gradual initiation into the dining compartment.

The surfaces in the dining room are all finished in metallic colors, allowing the background of the materials to retain their identity. The scheme is a combination of gun metal, oxidized blue, old gold and oxidized brass and copper, all mellowed to a rich, soft depth and luster. There is little in the way of embellishment or superfluous ornament. Decorative treatment is provided in a combination of metallic finishes and ornamentations on the deck cove and the over-window panels, which seem to blend into the background.

The ceiling is of rich cream and is free from decoration except for fine gold and black lines, which colors are recalled from the lower part of the car. These lines outline the panels which are formed by inconspicuous cross battens.

Angular Projections from the Ceiling Avoided

There are no sharp angular projections from the ceiling to the floor. On the contrary, a series of curvilinear effects avoids arresting attention from the balance of the car. In the four corners of the compartment are placed coves, thus avoiding all sharp angles.

No cross panels were used in the lower decks, this treatment preventing the proportion of length from

becoming foreshortened by transverse battens. The lower deck extends across the bulkheads at each end of the compartment, thereby providing a room instead of the usual hall effect.

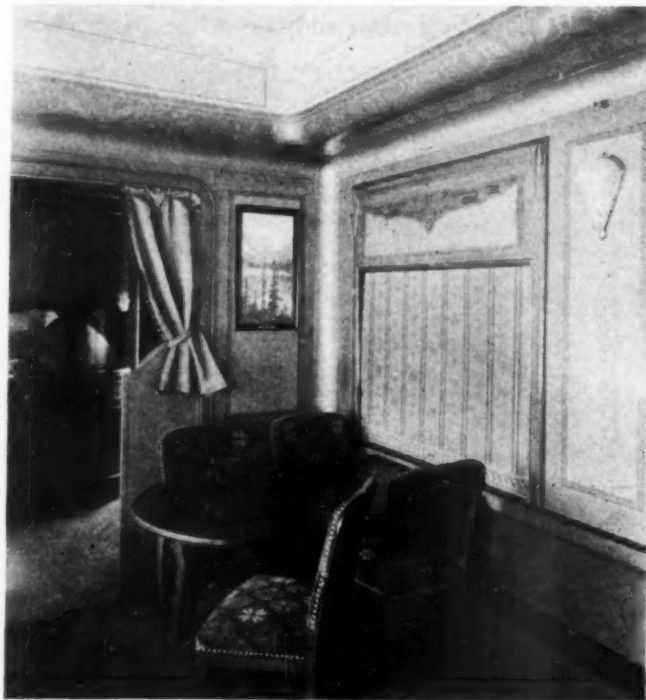
The aluminum window bottom rails are etched in a design significant of the Union Pacific, the car and its decoration. The window sills are of black laminated Bakelite, in juxtaposition to the metal window rails, and this not only enhances the effect by contrast, but provides a durable sill material, non-inflammable and non-soluble.

The sideboard at the end of the dining compartment is a centralized point of interest, combining, as it does, carefully-selected materials, good workmanship and an effective design for the purpose intended. All exposed woods are of walnut, Carpathian elm and ebony, finished in a tone that does not destroy the wood's beauty. Ivory lines are used for contrast. The mirror is a half-circle of silver plating, joined to a convex half of black plating; the silver mirror separates the black half from the Bakelite top, upon which is placed an electrically-lighted ornament, depicting the modernized graces supporting a shaft of light.

The safety lighting fixtures, made especially to serve the two-fold purpose of illumination and ornamentation, are beautifully executed in moulded glass and polished brass. In the center of the ceiling, the lighting fixtures alternate with fans of the same general design, and side fixtures are placed in each panel between the windows.

Window shades of striped silk material temper the light and soften the coloring by the relation of color values. The background is in a soft metallic blue, while the stripes are in old copper, bordered by fine silver and gold lines further bordered by black pencil lines, running with the broad stripes. The floor is covered in a special chenille carpeting of dark brown or rust background, and of an unobtrusive conventional floral design.

The chairs, made of walnut, were especially designed for these cars, with first thought given to comfort and convenience. They have fully upholstered seats and



Upholstery and Decoration Details

backs. The outsides of the backs are recessed or panelled, permitting the chair frames to be seen from the rear. A hand-hold is provided to move each chair about conveniently and a basket arrangement below the seat in which to place a hat. The upholstery material of special design conforms to the coloring used throughout the car.

The entire interior decoration and equipment of this car is designed to please by its simplicity and by the sincere expression of the materials used.

Rail Consolidation Procedure

By H. F. LANE

Washington Editor, *Railway Age*

WASHINGTON, D. C.

PROCEDURE before the Interstate Commerce Commission looking toward the consolidation of railways, or acquisitions of control preliminary to actual consolidation later, has entered upon a new stage now that the commission has promulgated its consolidation plan as directed by the transportation act of 1920. The fact that a new set of legal questions has arisen from the new status was brought out during the argument before the commission on January 17 on the application of the Baltimore & Ohio for authority to acquire control of the Buffalo, Rochester & Pittsburgh. Although the hearings were held and a generally favorable proposed report was issued by C. V. Burnside, assistant director of the commission's Bureau of Finance, last year before the plan was announced, the argument represented the first case since the issuance of the plan in which the commission has been asked to approve a unification which is in furtherance of the plan. An additional set of legal questions is involved in the proposed legislation now pending in Congress, but the House committee on interstate and foreign commerce is planning a rather exhaustive investigation of holding companies before proceeding further with the subject of consolidation.

It has also become apparent that the several applications filed with the commission last year by the Baltimore & Ohio, Chesapeake & Ohio, Delaware & Hudson and Wabash, in which each asked approval of plans for the grouping of lines in eastern territory, now represent little more than a record of the desires of the various applicants at that time. To receive any recognition by the commission they must be withdrawn or dismissed and brought to its attention in another form, either by amendment to make them conform to the plan proposed by the commission or in the form of applications for modification of the plan.

In their present form none of these applications presents for the consideration of the commission any specific terms and conditions which it could approve by the issuance of an order. Indeed, as to many of the lines proposed to be combined, no indication was furnished as to the ability of the applicant to obtain control, even if the commission should approve. In effect, therefore, the applications represent practically requests or recommendations for the commission to take into consideration in the preparation of its plan, which the commission has now accepted in part, ignored in part or disapproved in part.

To the extent to which the roads now desire to proceed in harmony with the plan they may file new applications. If they wish to persist in seeking authority for

acquisitions not in accordance with the plan they may apply for a modification, but it appears likely that any new applications for some time to come will still be filed under paragraph 2 of section 5 of the transportation act, which provides for the authorization of acquisitions short of complete consolidation. The provisions of the present law relating to valuation still operate as an obstacle to complete consolidations.

The pending applications of the Pittsburgh & West Virginia for authority to acquire control of the Wheeling & Lake Erie and Western Maryland are on a somewhat different footing, because the plan puts all three of those roads into the same system, the Wabash; and also the P. & W. V. has proposed more or less specific terms, although it has not yet shown its ability to acquire either property from the present owners nor that it is free from control by the Pennsylvania.

One of the questions asked by commissioners during the B. R. & P. argument was whether the commission may approve the building up of systems piece-meal, as by an acquisition of control of a single road in accordance with the allocation in the plan without reference to whether the other roads allocated to the same system will also be acquired later. Commissioner Farrell, who was formerly chief counsel of the commission, promptly answered the question by pointing out that the law provides that a consolidation to be approved must be "in harmony with" the plan, but H. T. Newcomb, general counsel of the Delaware & Hudson, took the position that it should not approve part of a plan without at least some assurance that the rest of the plan was to be carried out. Other counsel took the position that it is inevitable that the proposed great systems can only be built up step by step.

On the day before the B. R. & P. argument the commission had taken one step toward accomplishing its plan by ordering the Baltimore & Ohio to divest itself of its stock in the Western Maryland, holding that it had been acquired in violation of the Clayton act. The Western Maryland was one of the roads included in the Baltimore & Ohio general application filed a year ago and was also included in those of the Pittsburgh & West Virginia and Wabash. It was allocated in the plan to the proposed Wabash system and apparently if the B. & O. were to decide to conform as closely as possible with the plan it would endeavor to dispose of the stock to the Wabash or Pittsburgh & West Virginia.

The commission's interpretation of the Clayton act in the Western Maryland case also raises some question as to how a road should proceed to acquire even a property allocated to it in the plan if it can be held to be a competitive line. The commission said in the report that "although the consolidation provisions of the act, including paragraph 2 of section 5, clearly contemplate the subsequent lessening of competition between particular lines, it is equally clear that acquisitions of control which may have that effect are not to proceed without our authority."

Is the allocation of a line to a system in the plan an authorization?

The report points out that the B. & O. had offered to place its Western Maryland stock in the hands of trustees, pending determination of its application to acquire it, but says that "the statute in obedience to which we are now proceeding makes no provision for such disposition of the matter."

Commissioner Farrell dissented from the views of the majority, saying they constitute an erroneous interpretation of section 7 of the Clayton act and "unnecessarily render impossible, as a practical matter, the accomplish-

ment of the purpose Congress had in view when it passed the transportation act." Commissioners Brainerd and Woodlock concurred with him. "If such a purchase cannot be made," he said, "until after the intent to purchase has been advertised by an application made to us, it seems to me that it cannot be made at all as a practical matter, because such advertisement would result in such an increase in the price demanded for the stock to be purchased that the purchase would not be in the public interest."

In the pending case the question does not arise because the B. & O. has not yet acquired the stock of the B. R. & P. but has an option.

Opposition by the Pittsburgh & West Virginia and Wabash to the acquisition of the B. R. & P. by the B. & O. was withdrawn at the argument by counsel for those companies, on the ground that the commission had indicated its approval in the plan, but the Delaware & Hudson and the Pennsylvania persisted in their objections. The opening argument for the B. & O. was made by Luther M. Walter, who pointed out that the acquisition of the B. R. & P. is the first step toward the accomplishment of the plan, which the B. & O. is anxious to further. He also emphasized the complementary nature of the two lines and the importance of the B. R. & P. as a link in the proposed shorter route between Chicago and New York as well as to give the B. & O. an entrance to Buffalo. In view of the fact that the plan so allocates the line he asked for the omission of the condition proposed by Mr. Burnside, that the stock be held in such a way that the commission could later order another disposition of the B. R. & P.

Mr. Newcomb argued that the B. & O. and B. R. & P. are competitive and urged the commission to consider the offer of the D. & H. to acquire the B. R. & P. He also objected to the consideration of the application without reference to other parts of plan, saying that the argument as to the use of the line as part of a new short route is irrelevant unless there is some assurance that the B. & O. is also to acquire the Central of New Jersey and the Reading. It was at this point that Commissioner Meyer asked if the commission may properly pass upon part of a system and Mr. Newcomb expressed the opinion that it may not consider a part of a plan which is in furtherance of a major feature of a system without some showing that the major part can eventually be carried out.

C. B. Heiserman, general counsel of the Pennsylvania, said the pending case was being tried under paragraph 2 of section 5 on a record made before the plan was promulgated, and that it had not been shown that the acquisition would be in the public interest. The Pennsylvania, he said, is opposed to the plan in so far as it allocates the B. R. & P. to the B. & O.

H. W. Anderson, who made the closing argument for the B. & O., said that in that case the proper procedure for the Pennsylvania is to move for a modification of the plan. Replying to Mr. Newcomb he said that the relation of the B. R. & P. to the proposed short route is but one of the reasons for its acquisition by the B. & O., and that the commission has determined, in formulating its plan, that it is more in the public interest to allocate the B. R. & P. to the B. & O. than to any other system.

Commissioner Eastman asked if an application under paragraph 2 of section 5 must be in harmony with the plan which is provided for in paragraph 4 of section 5. Mr. Anderson replied that it must unless accompanied by an application to reopen the consolidation proceedings for a modification of the plan. Mr. Eastman re-

marked that that is not stated in terms in the act and must be read into it. The various parts of the act must be considered together, Mr. Anderson said, and since consolidations cannot be perfected until the valuation has been determined the commission can only develop systems step by step under paragraph 2. Mr. Anderson also argued that the delay in the settlement of the disposition of the B. R. & P. has operated injuriously to its service and organization and that since there is now no reason to keep it in suspense longer the proposed condition should not be included.

At the conclusion of the argument Mr. Newcomb obtained permission to file a memorandum of views as to the legal aspect of the situation in view of the promulgation of the plan and the other side will have an opportunity to file a reply.

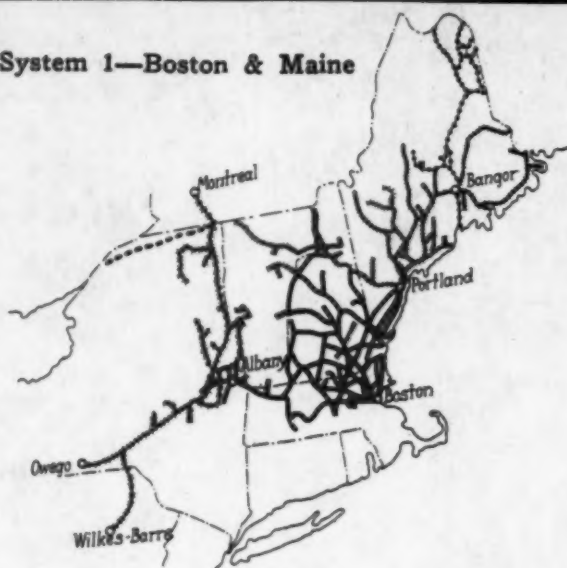
It is understood that the commission is planning to proceed soon under its complaint against the Pennsylvania under the Clayton law for acquisition of stock of the Wabash and Lehigh Valley through the Pennsylvania Company. In this connection it has been suggested that if the Pennsylvania should sell the stock back to the Delaware & Hudson Company, which will be left as a holding company with a considerable surplus after transferring its railroad properties to a new company, considerable progress might be made toward the development of the fifth eastern system suggested to the commission several years ago by L. F. Loree and adopted in a general way, but with the addition of the Norfolk & Western and Seaboard Air Line, in the consolidation plan. Many have believed that the Pennsylvania originally acquired the stock of the Wabash and Lehigh Valley not so much with the idea of keeping them for itself as to prevent them from falling into the hands of the Baltimore & Ohio or New York Central as part of the "four-system" plan and to hold them as the nucleus for the fifth system.

Wall Map Depicts 21 Consolidation Systems

THE *Railway Age*, for the convenience of its readers in visualizing the various railroads as they have been grouped into 21 systems by the Interstate Commerce Commission consolidation plan, has prepared a supplement to this issue which contains on one sheet maps of each of the proposed systems. All railroads have been drawn to the same scale, making it possible quickly to compare the size and extent of the systems. A distinction has been made between the trunk line roads by the use of distinguishing symbols or legends while short lines, in all maps, are noted by means of one symbol.

PULLMAN RESERVATIONS to the number of about 6,000 are made each day in the Information Bureau at Broad Street Station of the Pennsylvania at Philadelphia, the work covering reservations also for North Philadelphia and West Philadelphia stations. A sketch of the work in this bureau, printed in the Pennsylvania News, has a picture showing ten telephone attendants at work. James F. Loos, assistant ticket agent, has charge of the bureau. The number of sleeping cars regularly sent out nightly from the three stations named is 210, and the regular number of parlor cars sent out from the same stations daily is 358.

System 1—Boston & Maine



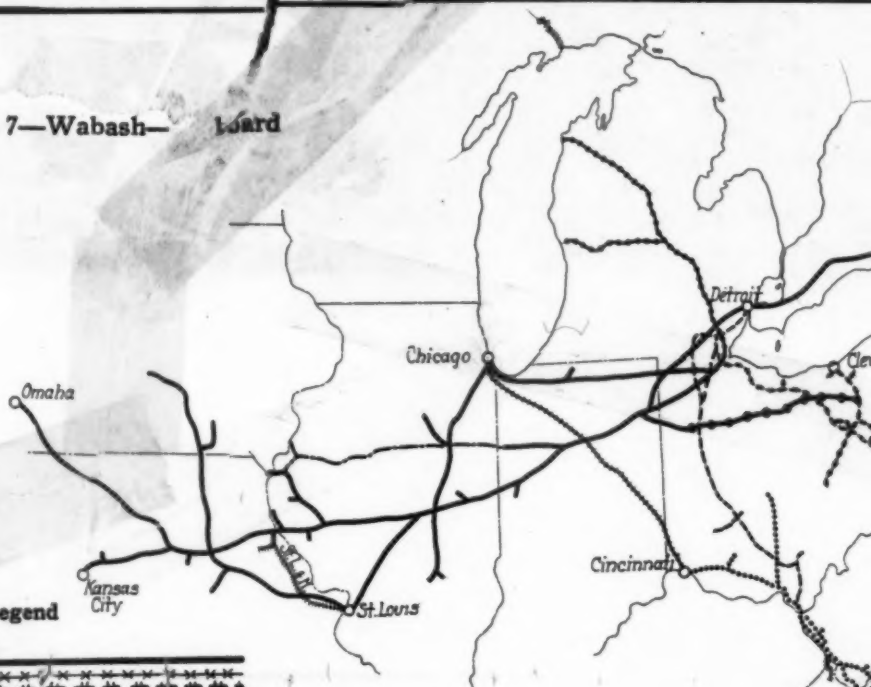
Legend

Boston & Maine
 Delaware & Hudson
 Bangor & Aroostook
 Maine Central
 Rutland
 O. and L. C. division Rouses Point, N. Y., to Ogdensburg.

Short Lines

St. Johnsbury & Lake Champlain
 Montpelier & Wells River
 Wilkes Barre Connecting (a)
 Monson
 Kennebec Central
 Knox
 Wiscasset, Waterville & Farmington
 Lime Rock
 Hoosac Tunnel & Wilmington
 Suncook Valley
 Berlin Mills
 Middleburgh & Schoharie
 Hardwick & Woodbury
 Barre & Chelsea
 Bridgton & Saco
 Sandy River & Rangeley Lakes
 Boston, Revere Beach & Lynn
 Troy Union (f)
 Mt. Washington
 Clarendon & Pittsford (a)
 Woodstock (a)
 Lake Champlain & Moriah

System 7—Wabash—Board



Legend

Wabash
 Lehigh Valley
 Wheeling & Lake Erie
 Pittsburgh & West Virginia
 Western Maryland
 Akron, Canton & Youngstown
 Toledo, Peoria & Western
 Ann Arbor
 Chesapeake & Ohio of Indiana
 Norfolk & Western
 Seaboard Air Line
 Detroit, Toledo & Ironton (a)

Also trackage rights over:

Pennsylvania, Logansport, Ind., to Effner.
 Grand Trunk, Ashley, Mich., to Muskegon.
 Reading, Shippensburg, Pa., to Harrisburg.
 Pennsylvania, Harrisburg, Pa., to Rockville.
 Reading, Rockville, Pa., to Blackwood.
 Reading, South Bethlehem, Pa., to Philadelphia.
 Pennsylvania, Delphos, Ohio, to Fort Wayne, Ind.

Short Lines

Chaffee
 East Berlin
 New Jersey, Indiana & Illinois
 Emmitsburg
 Susquehanna & New York
 Williamsport & North Branch
 Manistique & Lake Superior
 Chesapeake Western
 Valley River
 Big Sandy & Cumberland
 Franklin & Pennsylvania
 Marion & Rye Valley
 Virginia Southern
 Cumberland & Pennsylvania (b)
 Buffalo Creek (a)
 Genesee & Wyoming (d)
 Ironton (a)
 Lake Terminal (c)
 Patapsco & Back Rivers (b)
 Benwood & Wheeling Connecting (b)
 Philadelphia, Bethlehem & New England (a)
 South Buffalo (c)
 Aberdeen & Rockfish
 Bennettsville & Cheraw
 Birmingham & Southeastern
 Buffalo, Union-Carolina
 Cape Fear
 Cliffside
 Carolina & Northeastern
 Durham & Southern
 Edgemoor & Manetta
 Piedmont & Northern
 Georgia Southwestern & Gulf
 Greenville & Northern
 High Point, Thomasville & Denton
 Lawndale Railway & Industrial Co.
 Macon, Dublin & Savannah
 Maxton, Alma & Southbound

Moore Central
 St. Mary's
 Atlantic & Yadkin
 Townsville
 Virginia Southern
 Warrenton
 McRay Terminal
 Tampa Northern
 Interstate (a)
 Chatham Terminal (a)
 Winston-Salem Southbound (a)
 St. Louis & Hannibal

System 12—Great Northern-Northern Pacific

System 2—New Haven



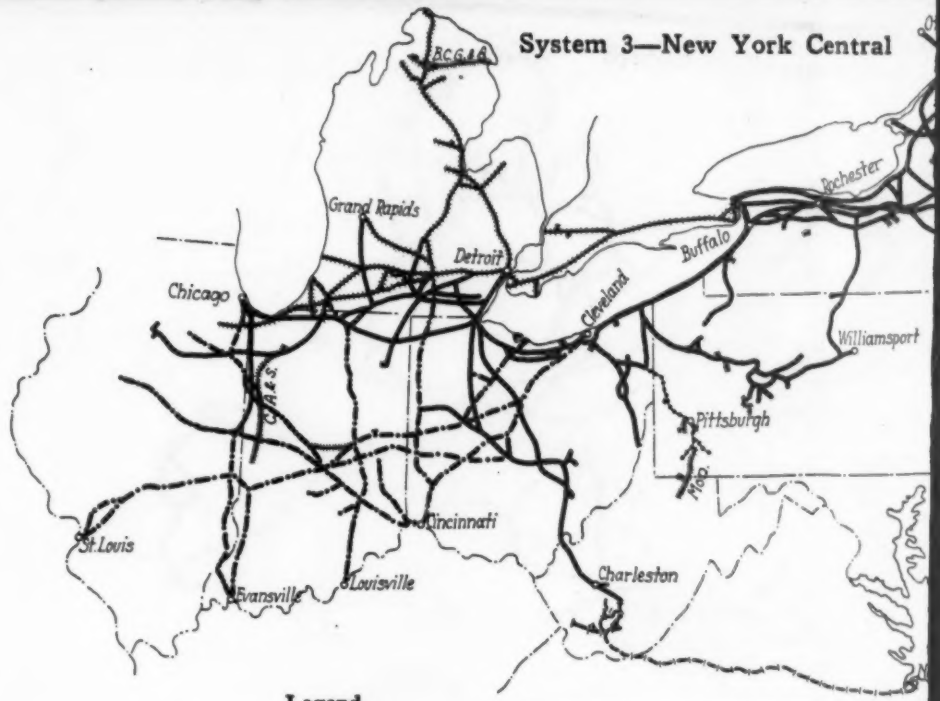
Legend

New York, New Haven & Hartford
New York, Ontario & Western
Lehigh & Hudson River
Lehigh & New England

Short Lines

New York Connecting (a)
South Manchester
Fore River
Moshassuck Valley
Narragansett Pier
Wood River Branch
Grafton & Upton (a)

System 3—New York Central



Legend

New York Central
Boston & Albany
Michigan Central
Cleveland, Cincinnati, Chicago & St. Louis
Including Cincinnati Northern
Evansville, Indianapolis & Terre Haute
Pittsburgh & Lake Erie
Virginian
Rutland—
Except O. and L. C. division, Rouses Point, N. Y., to
Ogdensburg.

Short Lines

Boyer City, Gaylord & Alpena
Bristol
Clarendon & Pittsford (a)
Grafton & Upton (a)
Chicago, Attica & Southern
Ulster & Delaware
Federal Valley
Fonda, Johnstown & Gloversville
Glenfield & Western
Grasse River
Lake Erie, Franklin & Clarion
Lakeside & Marblehead
Lowville & Beaver River
Marcellus & Otisco Lake
Norwood & St. Lawrence

Skaneateles
Dexter & Northern
Campbell's Creek
Kelley's Creek & Northwest
Kelley's Creek
Lorain & Southern
Fulton Chain
Cambria & Indiana (b)
Central Indiana (a)
Cherry Tree & Dixonville (a)
Fairport, Painesville & Eastern
Genesee & Wyoming (d)
Lake Erie & Pittsburgh (a)
Lake Terminal (c)
Muncie & Western (b)
McKeesport Connecting (b)
Beaver Valley (a)
Indiana Northern (c)
Lake Erie & Fort Wayne (d)
South Buffalo (e)
Troy Union (b)
Owasco
Monongahela (b)
Pittsburgh, Chartiers & Young
Half interest in line of Virginia
W. Va.

System 8—Atlantic Coast Line



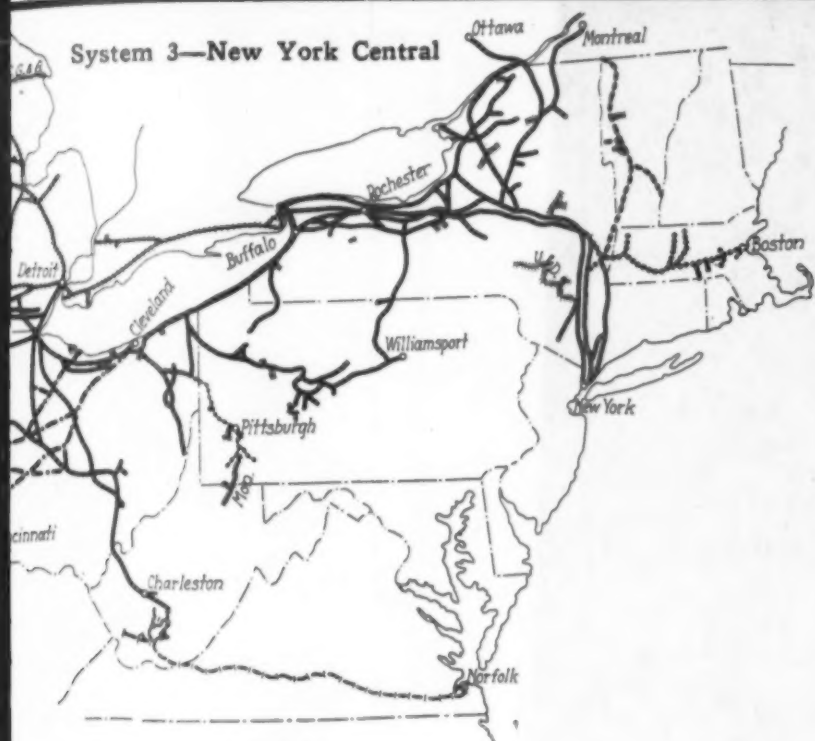
Legend

Atlantic Coast Line
Louisville & Nashville
Nashville, Chattanooga & St. Louis
Cincinnati
Atlanta, Birmingham & Coast
Gulf, Mobile & Northern
New Orleans Great Northern
Chicago, Indianapolis & Louisville (c)

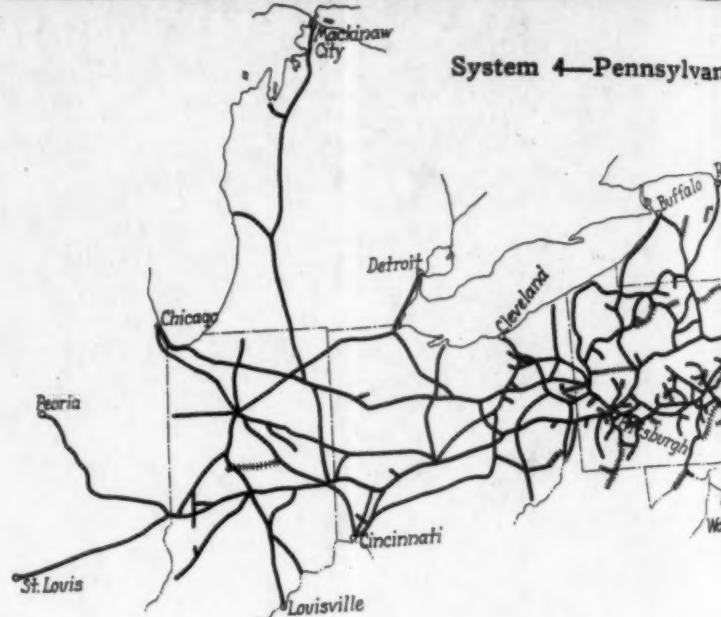
Short Lines

Winston-Salem Southbound (a)
Alabama & Western Florida
Alabama, Florida & Gulf
Alcala
Apalachicola Northern
Artemus-Jellico
Ashland
Atlantic & Carolina
Charleston & Western Carolina
Columbia, Newberry & Laurens
Elberton & Eastern
Live Oak, Perry & Gulf
Rockingham
Virginia & Carolina Southern
Beaufort Country Lumber
Black Mountain
Bonhomie & Hattiesburg Southern
Carolina Southern
Carolina Western
Carrollton & Worthville
Chattahoochee Valley
East Carolina
Flemingsburg & Northern
Hampton & Branchville
Kentucky, Rockcastle & Cumberland
Laurinburg & Southern

Mammoth Cave
Manatee & Repton
Marianna & Blountstown
Milstead
Lakeland
Mississippi & Western
Mississippi Central
Mississippi Export
Mountain Central
Nashville & Atlantic
Northwestern of South Carolina
Norton & Northern
Ohio & Kentucky
Roaring Fork
Rockcastle River
Savannah & Atlanta
Tennessee, Alabama & Georgia
Tuskegee
Washington & Lincoln
Wilmington, Brunswick & Southern
Belt Line
Savannah River Terminal
Port St. Joe Dock & Terminal



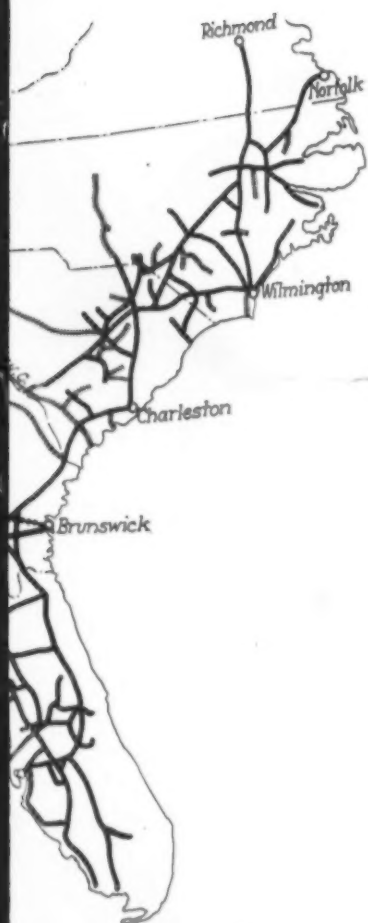
- Skaneateles
Dexter & Northern
Campbell's Creek
Kelley's Creek & Northwestern
Kelley's Creek
Lorain & Southern
Fulton Chain
Cambria & Indiana (b)
Central Indiana (a)
Cherry Tree & Dixonville (a)
Fairport, Painesville & Eastern (b)
Genesee & Wyoming (d)
Lake Erie & Pittsburgh (a)
Lake Terminal (c)
Muncie & Western (b)
McKeesport Connecting (b)
Beaver Valley (a)
Indiana Northern (c)
Lake Erie & Fort Wayne (b)
South Buffalo (c)
Troy Union (b)
Owasco
Monongahela (b)
Pittsburgh, Chartiers & Youghiogheny (a)
Half interest in line of Virginian between Gilbert and Mullens, W. Va.



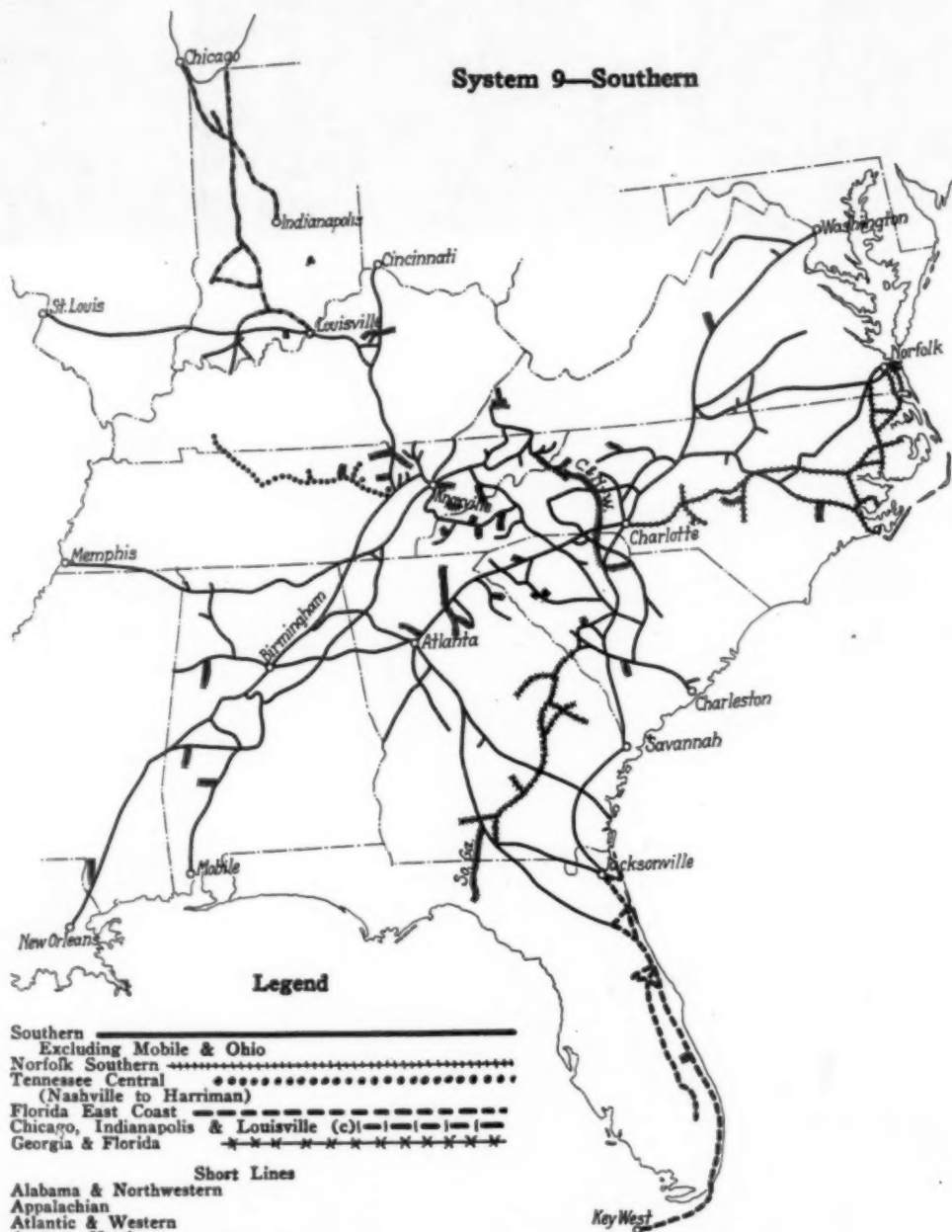
- Legend**
- Pennsylvania
Including Long Island
West Jersey & Seashore
Baltimore, Chesapeake & Atlantic
- Short Lines**
- New York & Long Branch (a)
Arcade & Attica
Bellefonte Central
Coudersport & Port Allegheny
East Broadtop Railroad & Coal Co.
Hickory Valley
Huntington & Broad Top Mountain Railroad & Coal Co.
Kane & Elk
Kishacoquillas Valley
Ligonier Valley
Marion
Maryland & Delaware Coast
Pittsburgh, Lisbon & Western
Pittsburgh & Susquehanna
Sheffield & Tionesta
Youngstown & Ohio
Stewardstown
Strasburg
Susquehanna River & Western
Tuscarora Valley
Washington, Brandywine & Point Lookout
New York Connecting (a)
Winfield
Dents Run

- Donora
Alliquipp
Chesapeake
Pennsylvania
Scottdale
Monongahela
Central
Cherry Tree
Cumberland
Wilkes Barre
Genesee
Lake Erie
Muncie
Etna &
Johnstown
McKeesport
New Haven
Beaver Valley
Conemaugh
Steelton
Indiana
Lake Erie
Patapsco
Benwood
South Branch
Baltimore
Ohio River
Western
Pittsburgh

Atlantic Coast Line



- Mammoth Cave
Manistee & Repton
Marianna & Blountstown
Millstead
Lakeland
Mississippi & Western
Mississippi Central
Mississippi Export
Mountain Central
Nashville & Atlantic
Northwestern of South Carolina
Norton & Northern
Ohio & Kentucky
Roaring Fork
Rockcastle River
Savannah & Atlanta
Tennessee, Alabama & Georgia
Tuskegee
Washington & Lincolnton
Wilmington, Brunswick & Southern
Belt Line
Savannah River Terminal
Port St. Joe Dock & Terminal



- Legend**
- Southern
Excluding Mobile & Ohio
Norfolk Southern
Tennessee Central
(Nashville to Harriman)
Florida East Coast
Chicago, Indianapolis & Louisville (c)
Georgia & Florida
- Short Lines**
- Alabama & Northwestern
Appalachian
Atlantic & Western
Augusta Northern
Bamberg, Ehrhardt & Walterboro
Carolina & Northwestern
Dover & South Bound
Due West
East Tennessee & Western North Carolina
Elkin & Allegheny
Frankfort & Cincinnati
Gainesville & Northwestern
Gainesville Midland
Graham County
Hartwell
Lancaster & Chester
Linville River
Little River
Trans-Florida Central
Mobile & Gulf
Morgan & Fentress

- Oneida & Western
Pearl River Valley
Pickens
Pigeon River
South Georgia
Sumter & Choctaw
Tennessee
Tennessee & North Carolina
Tennessee, Kentucky & Northern
Tuckaseegee & Southeastern
Virginia Blue Ridge
Ware Shoals
Cincinnati, Burnside & Cumberland River
Ferdinand
Louisville, New Albany & Corydon
Interstate (a)

System 13—Milwaukee

Pennsylvania



- Donora Southern
- Alliquippa & Southern
- Chesapeake Beach
- Pennsylvania & Atlantic
- Scotac
- Monongahela (b)
- Cambria & Indiana (b)
- Central Indiana (a)
- Cherry Tree & Dixonville (a)
- Cumberland & Pennsylvania (b)
- Wilkes Barre Connecting (a)
- Genesee & Wyoming (d)
- Lake Erie & Pittsburgh (a)
- Muncie & Western (b)
- Etna & Montrose (a)
- Johnstown & Stony Creek (a)
- McKeesport Connecting (b)
- New Haven & Dunbar (a)
- Beaver Valley (a)
- Conemaugh & Black Lick (a)
- Steelton & Highspire (a)
- Indiana Northern (c)
- Lake Erie & Fort Wayne (b)
- Patapsco & Back Rivers (b)
- Benwood & Wheeling Connecting (b)
- South Buffalo (c)
- Baltimore & Eastern
- Ohio River & Western
- Western Allegheny
- Pittsburgh, Chartiers & Youghiogheny (a)

System 5—Baltimore & Ohio



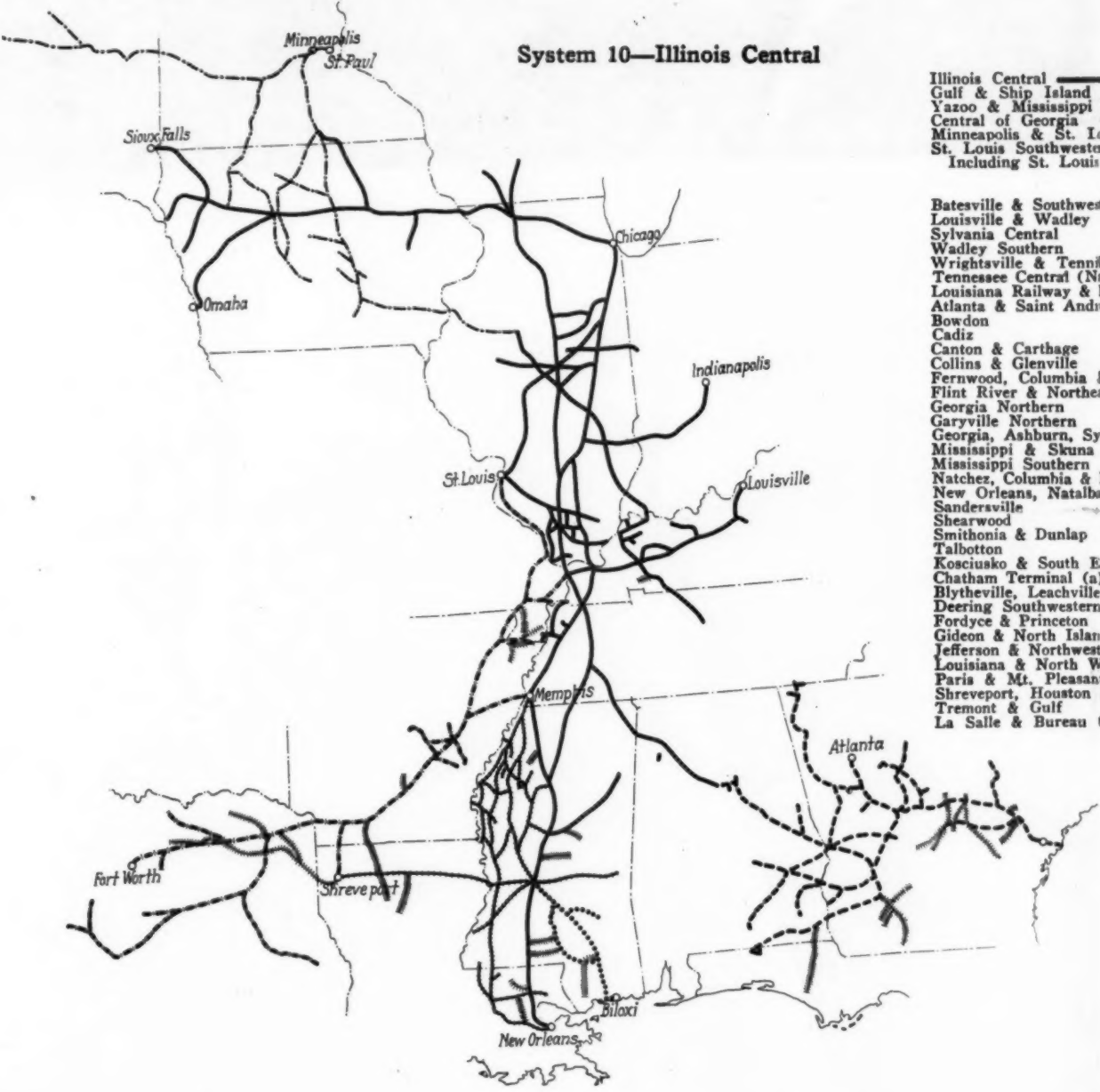
Legend

- Baltimore & Ohio
- Including Staten Island Rapid Transit
- Reading
- Central of New Jersey
- Chicago & Alton
- Buffalo, Rochester & Pittsburgh
- Detroit, Toledo & Ironton (a)
- Chicago, Indianapolis & Louisville (a)
- Trackage rights over Western Maryland between Shippensburg, Pa., and Cherry Run, W. V.

- Atlantic City
- Perkiomen
- Port Reading
- Detroit & Toledo Shore Line (a)
- Sharpsville
- Castelman River
- Chestnut Ridge
- Cornwall
- Kansas & Sidell
- Maryland & Pennsylvania
- Mount Hope Mineral
- Mount Jewett, Kinzua & Riterville
- New York & Long Branch (a)
- Quakertown & Bethlehem
- Rahway Valley
- Raritan River
- Stone Harbor
- Tuckerton
- Philadelphia & Beach Haven
- Ursina & North Fork

- Upper Merion & Plymouth Va
- Washington Run
- West Virginia Northern
- Wharton & Northern
- Wildwood & Delaware Bay Sh
- Yale Short Line
- Preston
- Buffalo Creek & Gauley
- Rowlesburg & Southern
- Strouds Creek & Muddlety
- West Virginia Midland
- Winchester & Western
- Brownstone & Middletown
- Tionesta Valley
- Monongahela (b)
- Cambria & Indiana (b)
- Cumberland & Pennsylvania
- Fairport, Painesville & Eastern
- Genesee & Wyoming (d)
- Ironton (a)
- Northampton & Bath (a)
- Lake Terminal (c)
- Etna & Montrose (a)
- Johnstown & Stony Creek (a)
- McKeesport Connecting (b)
- New Haven & Dunbar (a)
- Conemaugh & Black Lick (a)
- Steelton & Highspire (a)
- Patapsco & Back Rivers (b)
- Benwood & Wheeling Connect
- Philadelphia, Bethlehem & Ne
- South Buffalo (c)
- Buffalo & Susquehanna

System 10—Illinois Central

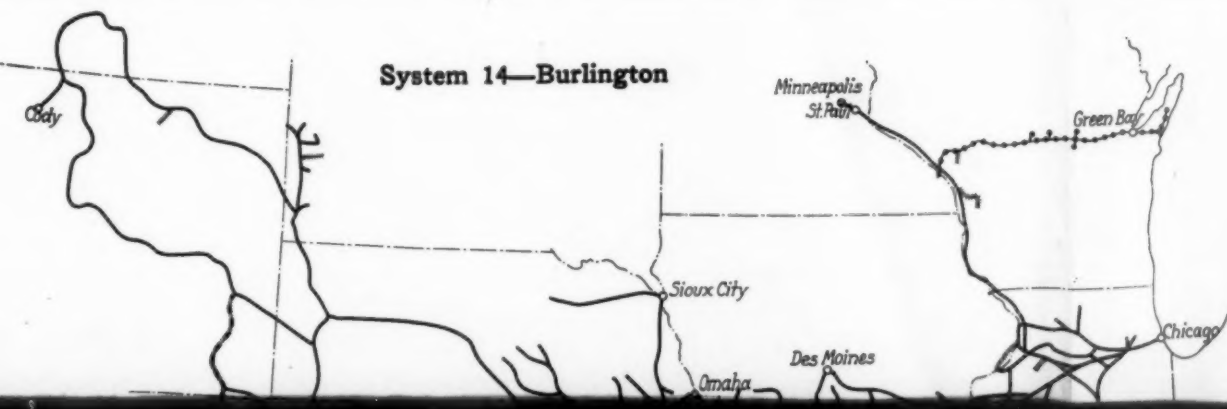


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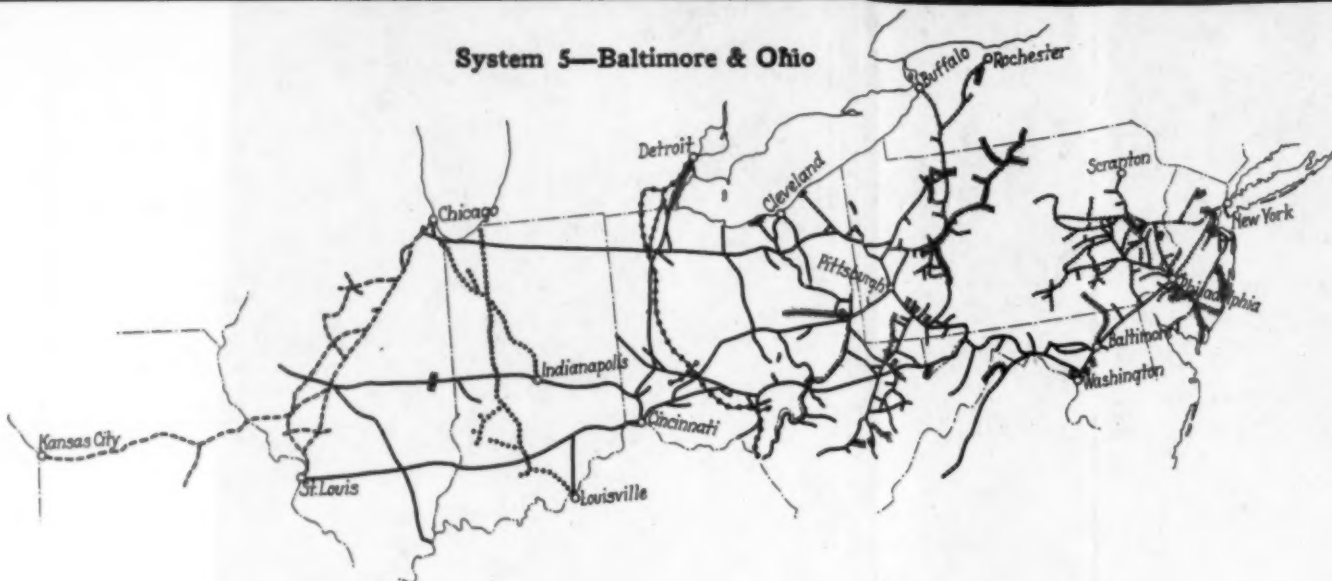
- Illinois Central
- Gulf & Ship Island
- Yazoo & Mississippi Valley
- Central of Georgia
- Minneapolis & St. Louis
- St. Louis Southwestern
- Including St. Louis Southwestern of Texas

- Short Lines
- Batesville & Southwestern
- Louisville & Wadley
- Sylvania Central
- Wadley Southern
- Wrightsville & Tennesse
- Tennessee Central (Nashville to Hopkinsville)
- Louisiana Railway & Navigation of Texas
- Atlanta & Saint Andrews Bay
- Bowdon
- Cadiz
- Canton & Carthage
- Collins & Glenville
- Fernwood, Columbia & Gulf
- Flint River & Northeastern
- Georgia Northern
- Garyville Northern
- Georgia, Ashburn, Sylvester & Camilla
- Mississippi & Skuna Valley
- Mississippi Southern
- Natchez, Columbia & Mobile
- New Orleans, Natalbany & Natches
- Sandersville
- Shearwood
- Smithonia & Dunlap
- Talbotton
- Kosciusko & South Eastern
- Chatham Terminal (a)
- Blytheville, Leachville & Arkansas Southern
- Deering Southwestern
- Fordyce & Princeton
- Gideon & North Island
- Jefferson & Northwestern
- Louisiana & North West
- Paris & Mt. Pleasant
- Shreveport, Houston & Gulf
- Tremont & Gulf
- La Salle & Bureau County

System 14—Burlington



System 5—Baltimore & Ohio



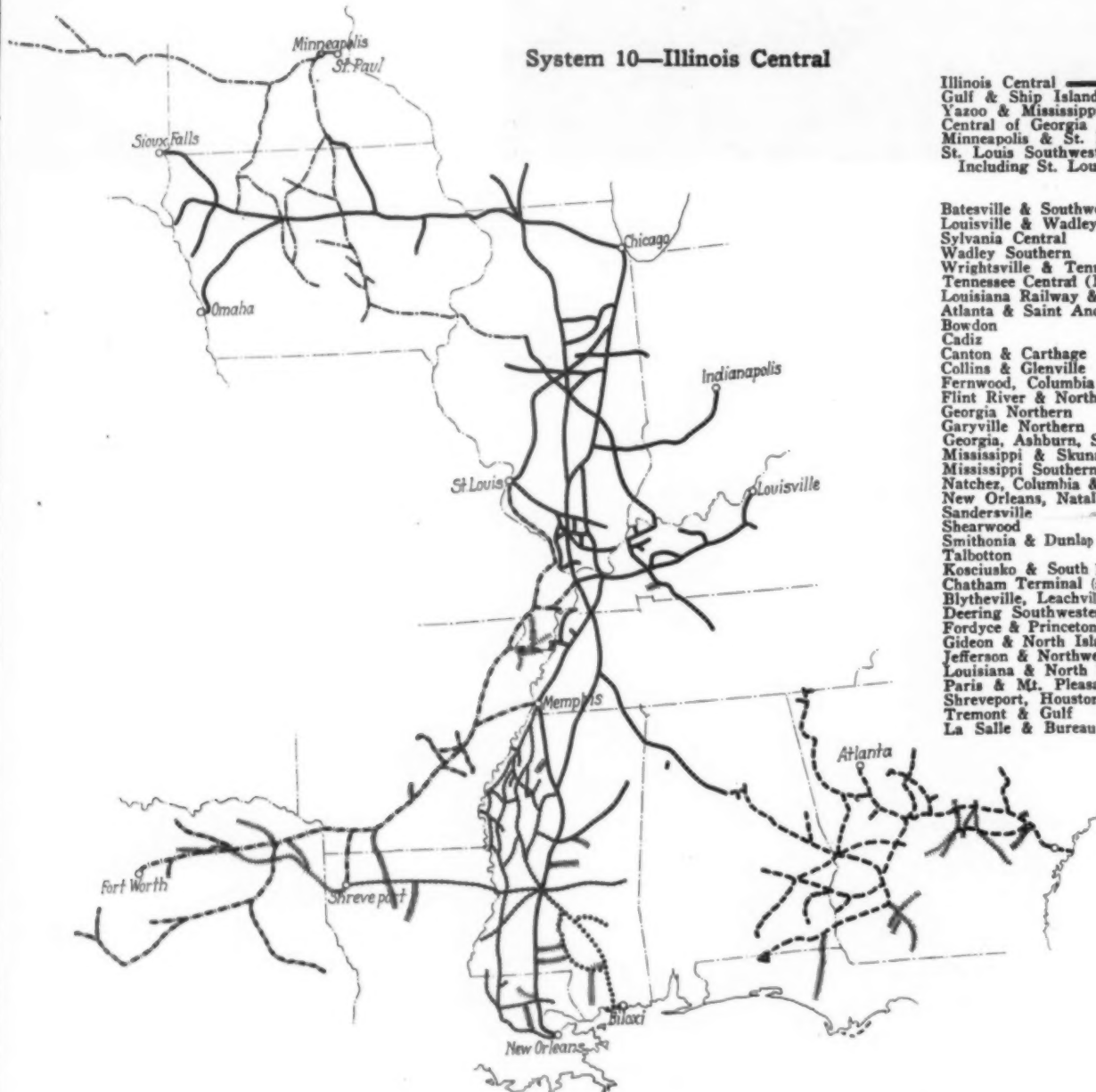
Legend

Baltimore & Ohio
Including Staten Island Rapid Transit
Reading
Central of New Jersey
Chicago & Alton
Buffalo, Rochester & Pittsburgh
Detroit, Toledo & Ironton (a)
Chicago, Indianapolis & Louisville (a)
Trackage rights over Western Maryland between Shippensburg, Pa., and Cherry Run, W. V.

Atlantic City
Perkiomen
Port Reading
Detroit & Toledo Shore Line (a)
Sharpsville
Castleman River
Chestnut Ridge
Cornwall
Kansas & Sidell
Maryland & Pennsylvania
Mount Hope Mineral
Mount Jewett, Kinzua & Rittville
New York & Long Branch (a)
Quakertown & Bethlehem
Rahway Valley
Raritan River
Stone Harbor
Tuckerton
Philadelphia & Beach Haven
Ursina & North Fork

Upper Merion & Plymouth Valley
Washington Run
West Virginia Northern
Wharton & Northern
Wildwood & Delaware Bay Short Line
Yale Short Line
Preston
Buffalo Creek & Gauley
Rowlesburg & Southern
Strouds Creek & Muddlety
West Virginia Midland
Winchester & Western
Brownstone & Middletown
Tionesta Valley
Monongahela (b)
Cambria & Indiana (b)
Cumberland & Pennsylvania (b)
Fairport, Painesville & Eastern (b)
Genesee & Wyoming (d)
Ironton (a)
Northampton & Bath (a)
Lake Terminal (c)
Etna & Montrose (a)
Johnstown & Stony Creek (a)
McKeesport Connecting (b)
New Haven & Dunbar (a)
Conemaugh & Black Lick (a)
Steelman & Highspire (a)
Patapsco & Back Rivers (b)
Benwood & Wheeling Connecting (b)
Philadelphia, Bethlehem & New England (a)
South Buffalo (e)
Buffalo & Susquehanna

System 10—Illinois Central



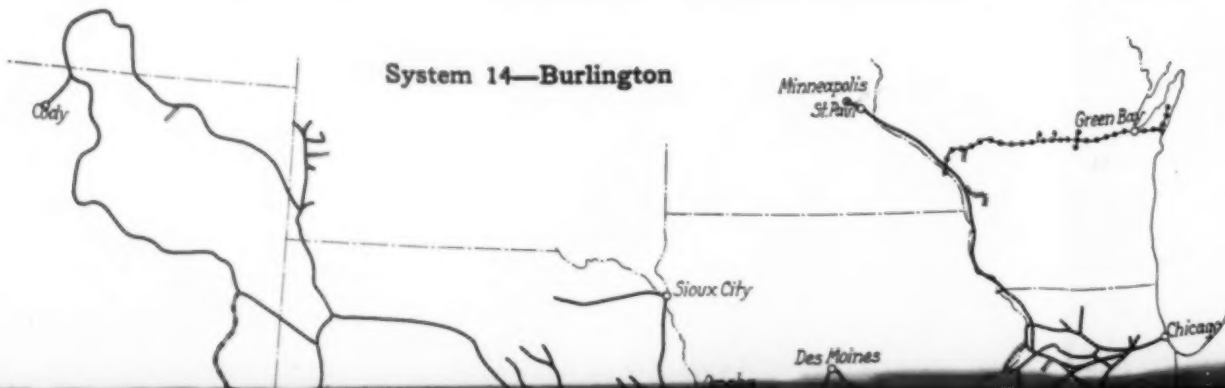
Legend

Illinois Central
Gulf & Ship Island
Yazoo & Mississippi Valley
Central of Georgia
Minneapolis & St. Louis
St. Louis Southwestern
Including St. Louis Southwestern of Texas

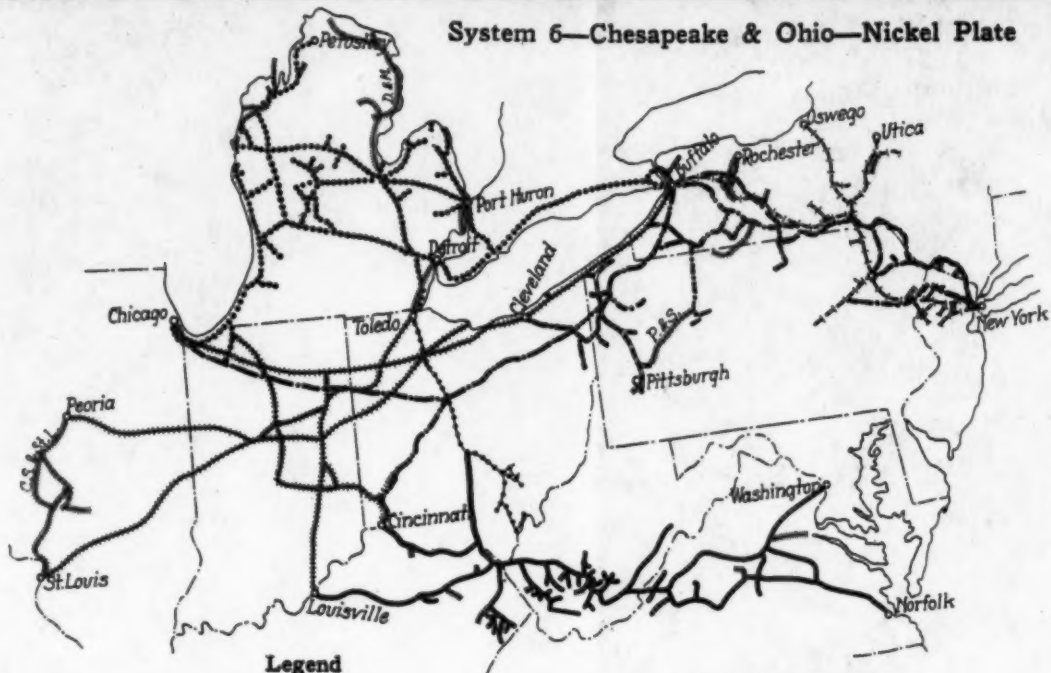
Short Lines

Batesville & Southwestern
Louisville & Wadley
Sylvania Central
Wadley Southern
Wrightsville & Tennile
Tennessee Central (Nashville to Hopkinsville)
Louisiana Railway & Navigation of Texas
Atlanta & Saint Andrews Bay
Bowdon
Cadiz
Canton & Carthage
Collins & Glenville
Fernwood, Columbia & Gulf
Flint River & Northeastern
Georgia Northern
Garyville Northern
Georgia, Ashburn, Sylvester & Camilla
Mississippi & Skuna Valley
Mississippi Southern
Natchez, Columbia & Mobile
New Orleans, Natalbany & Natchez
Sandersville
Shearwood
Smithonia & Dunlap
Talbotton
Kosciusko & South Eastern
Chatham Terminal (a)
Blytheville, Leachville & Arkansas Southern
Deering Southwestern
Fordyce & Princeton
Gideon & North Island
Jefferson & Northwestern
Louisiana & North West
Paris & Mt. Pleasant
Shreveport, Houston & Gulf
Tremont & Gulf
La Salle & Bureau County

System 14—Burlington



System 6—Chesapeake & Ohio—Nickel Plate



Legend

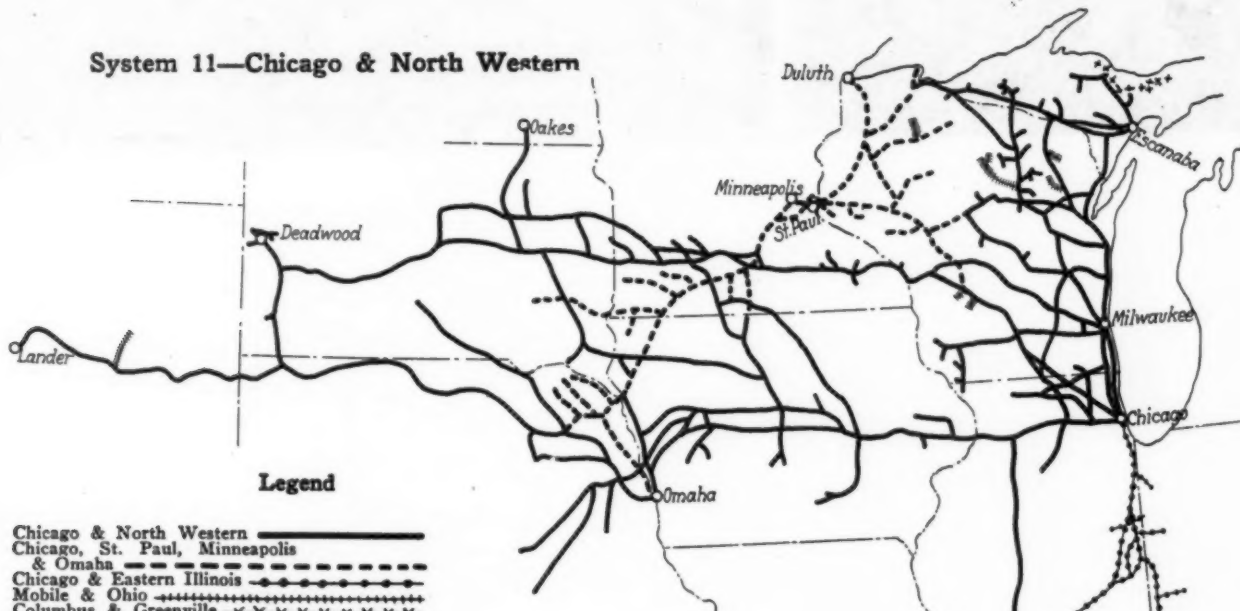
Chesapeake & Ohio
 Excluding Chesapeake & Ohio of Indiana
 Hocking Valley
 Pere Marquette
 Erie
 Including Chicago & Erie
 New York, Susquehanna & Western
 New Jersey & New York
 Delaware, Lackawanna & Western
 New York, Chicago & St. Louis
 Bessemer & Lake Erie
 Also trackage rights over:
 Baltimore & Ohio, Dayton, Ohio, to Hamilton, and Cincinnati, Ohio, and Indianapolis, Ind.
 Southern, Orange, Va., to Potomac Yards
 Cleveland, Cincinnati, Chicago & St. Louis and Baltimore & Ohio, Rushville, Ind., to Louisville, Ky.
 Louisville & Nashville, Lexington, Ky., to Louisville.

Short Lines

Pittsburg & Shawmut
 Chicago & Illinois Midland
 Jacksonville & Havana
 Chicago, Springfield & St. Louis
 Alton & Eastern
 Detroit & Toledo Shore Line (a)
 Arcadia & Betsey River
 Dansville & Mount Morris
 Delaware Valley
 Detroit & Mackinac
 Detroit, Caro & Sandusky

East Jordan & Southern
 Manistee & North-Eastern
 Middletown & Unionville
 Morristown & Erie
 New York & Pennsylvania
 Port Huron & Detroit
 Prattsburgh
 Sterling Mountain
 Unadilla Valley
 Unity
 West Pittston-Exeter
 Kanawha Central
 Winifrede
 Kanawha, Glen Jean & Eastern
 Ludington & Northern
 Euclid
 East Kentucky Southern
 Brooksville & Ohio River
 Big Sandy & Kentucky River
 Morehead & North Fork
 Nelson & Albemarle
 Virginia Central
 Half interest in line of Virginian between
 Gilbert and Mullens, W. Va.
 Buffalo Creek (a)
 Fairport, Painesville & Eastern (b)
 Genesee & Wyoming (d)
 Northampton & Bath (a)
 Lake Terminal (c)
 Muncie & Western (b)
 Lake Erie & Fort Wayne (b)
 South Buffalo (c)

System 11—Chicago & North Western



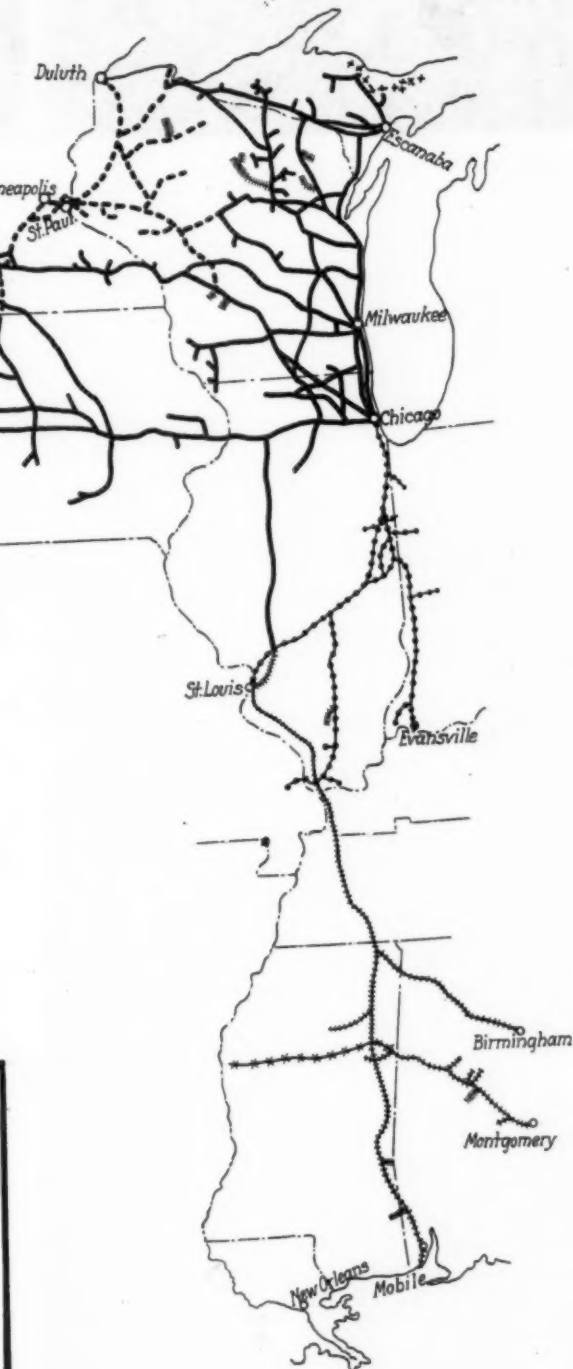
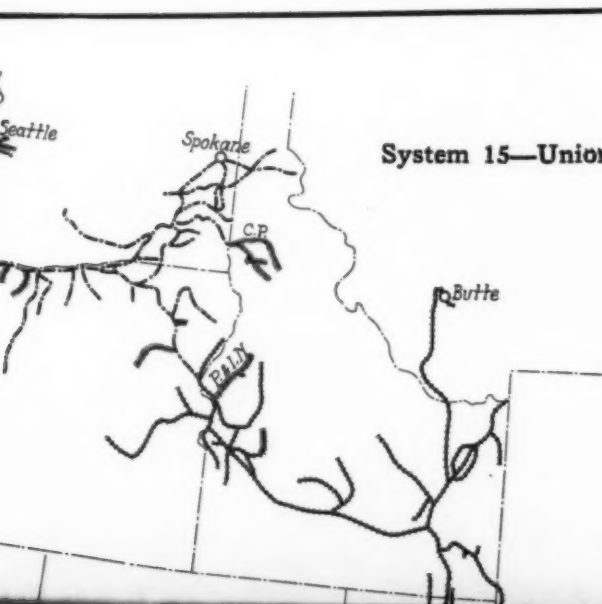
Legend

Chicago & North Western
 Chicago, St. Paul, Minneapolis
 & Omaha
 Chicago & Eastern Illinois
 Mobile & Ohio
 Columbus & Greenville
 Lake Superior & Ishpeming

Short Lines

Cazenovia Southern
 Hillsboro & North-Eastern
 Mineral Point & Northern
 North & South
 Superior & Southeastern
 Sioux City Bridge
 Northwestern Coal
 Alabama Central
 Birmingham, Selma & Mobile
 DeKalb & Western
 Mississippi & Alabama
 Mississippi Eastern
 Jefferson Southwestern
 Litchfield & Madison

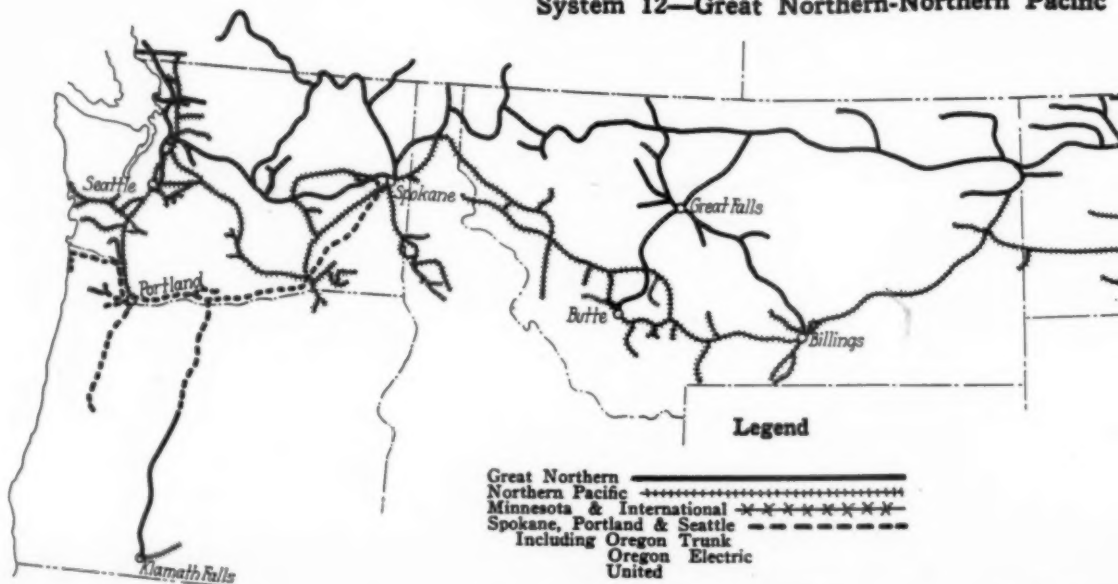
System 15—Union Pacific



Bennettsville & Chester
 Birmingham & Southeastern
 Buffalo, Union-Carolina
 Cape Fear
 Cliffside
 Carolina & Northeastern
 Durham & Southern
 Edgemoor & Manetta
 Piedmont & Northern
 Georgia Southwestern & Gulf
 Greenville & Northern
 High Point, Thomasville & Denton
 Lawndale Railway & Industrial Co.
 Macon, Dublin & Savannah
 Maxton, Alma & Southbound

Atlantic & Yadkin
 Townsville
 Virginia Southern
 Warrenton
 McRay Terminal
 Tampa Northern
 Interstate(a)
 Chatham Terminal (a)
 Winston-Salem Southbound (a)
 St. Louis & Hannibal

System 12—Great Northern-Northern Pacific



Legend

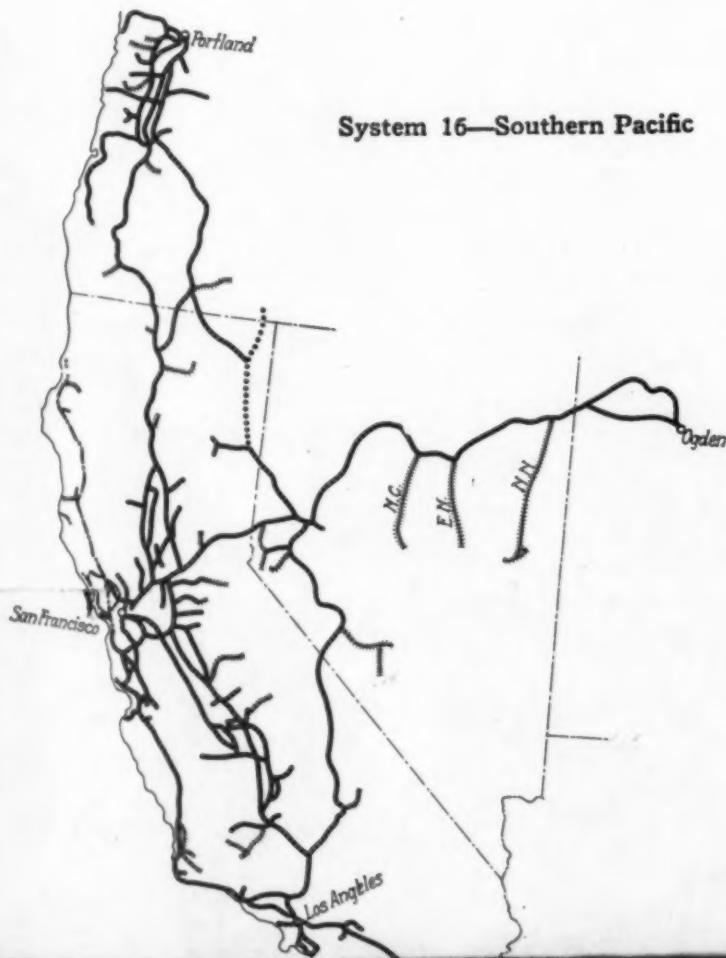
Great Northern —————
 Northern Pacific +-----+-----+
 Minnesota & International *-----*
 Spokane, Portland & Seattle - - - - -
 Including Oregon Trunk
 Oregon Electric
 United

Short Lines

Farmers Grain & Shipping
 Gilmore & Pittsburgh
 Butte, Anaconda & Pacific (a)
 Gales Creek & Wilson River
 Hartford Eastern
 Hill City
 Minneapolis & Rainy River
 Minneapolis, Red Lake & Manitoba
 Minnesota, Dakota & Western
 Montana Western
 Montana, Wyoming & Southern
 Puget Sound & Cascade

Waterville
 Washington W
 Camas Prairie
 Cowlitz, Chehalis
 Newaukum Valley
 Craig Mountain
 Duluth & North
 Longview, Portland
 Nezperce & Idaho
 Oregon, California
 Washington, Idaho
 Columbia & Co

System 16—Southern Pacific



San Francisco

Los Angeles

Tucumcari

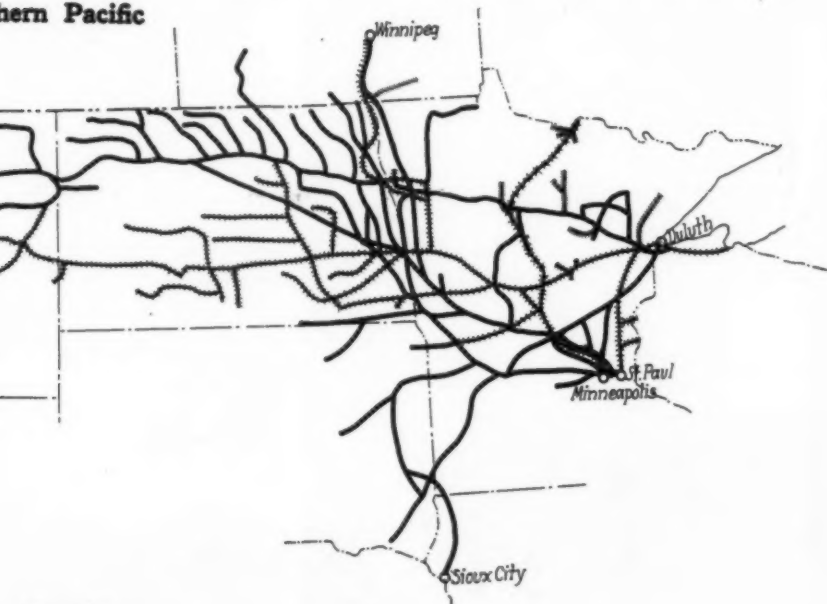
Atchafalaya
 In
 Gulf, Panhandle
 In
 Chicago
 Missoula
 Middle



Rockingham
Virginia & Carolina Southern
Beaufort Country Lumber
Black Mountain
Bonhomie & Hattiesburg Southern
Carolina Southern
Carolina Western
Carrollton & Worthville
Chattahoochee Valley
East Carolina
Flemingsburg & Northern
Hampton & Branchville
Kentucky, Rockcastle & Cumberland
Laurinburg & Southern

Northwestern of
Norton & Northern
Ohio & Kentucky
Roaring Fork
Rockcastle River
Savannah & Atlanta
Tennessee, Alabama & Georgia
Tuskegee
Washington & Lincoln
Wilmington, Brunswick & Southern
Belt Line
Savannah River Terminal
Port St. Joe Dock & Terminal

ern Pacific



Legend

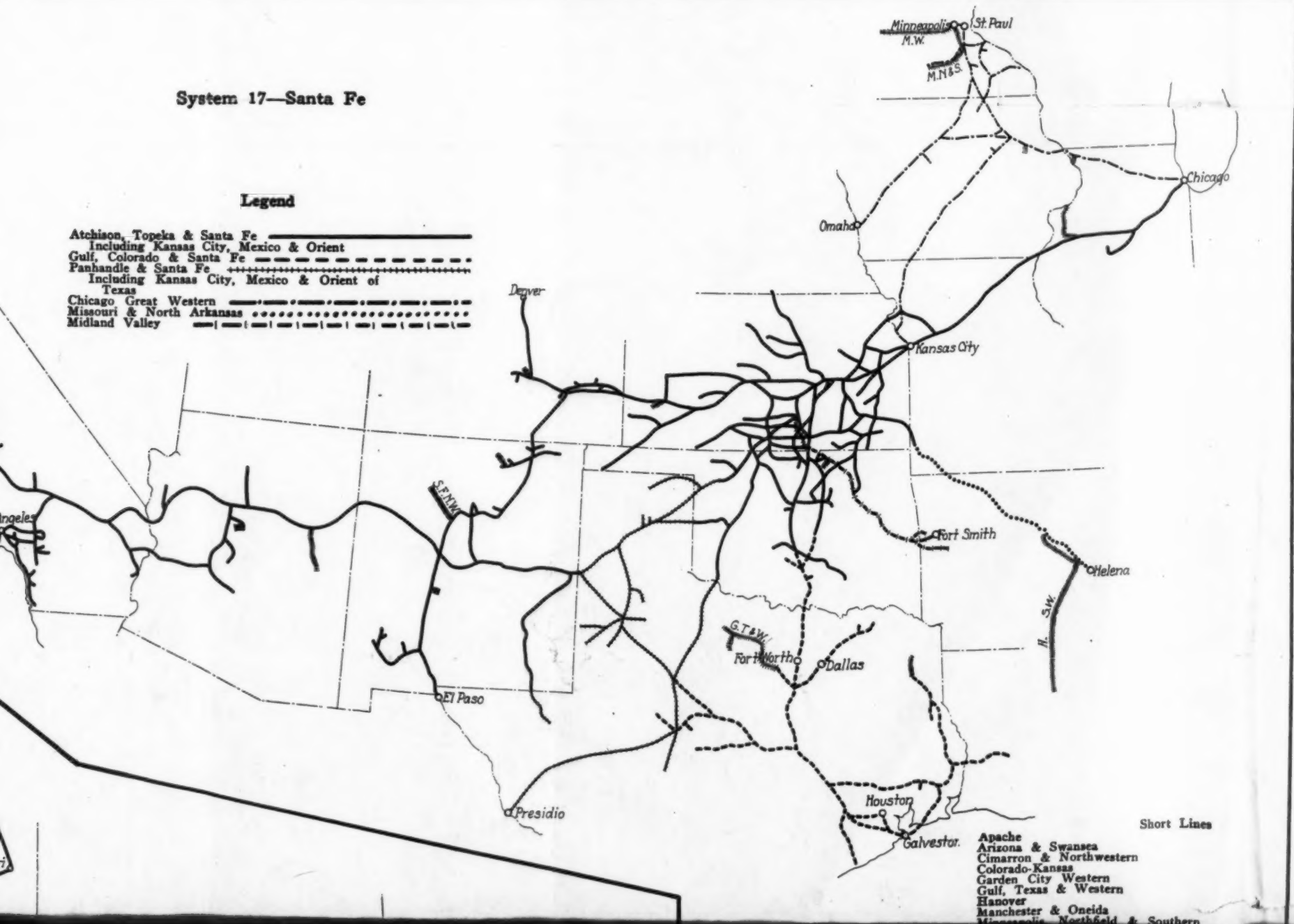
Chicago, Milwaukee, St. Paul & Pacific
Including Chicago, Milwaukee & Gary
Duluth, Missabe & Northern
Duluth & Iron Range
Trackage rights over Spokane, Portland & Seattle from
Portland, Ore., to Spokane, Wash.

Waterville
Washington Western
Camas Prairie (a)
Cowlitz, Chehalis & Cascade (b)
Newaukum Valley (b)
Craig Mountain (a)
Duluth & Northeastern (a)
Longview, Portland & Northern (a)
Nespecke & Idaho (a)
Oregon, California & Eastern (a)
Washington, Idaho & Montana (a)
Columbia & Cowlitz

System 17—Santa Fe

Legend

Atchison, Topeka & Santa Fe
Including Kansas City, Mexico & Orient
Gulf, Colorado & Santa Fe
Panhandle & Santa Fe
Including Kansas City, Mexico & Orient of
Texas
Chicago Great Western
Missouri & North Arkansas
Midland Valley



Short Lines

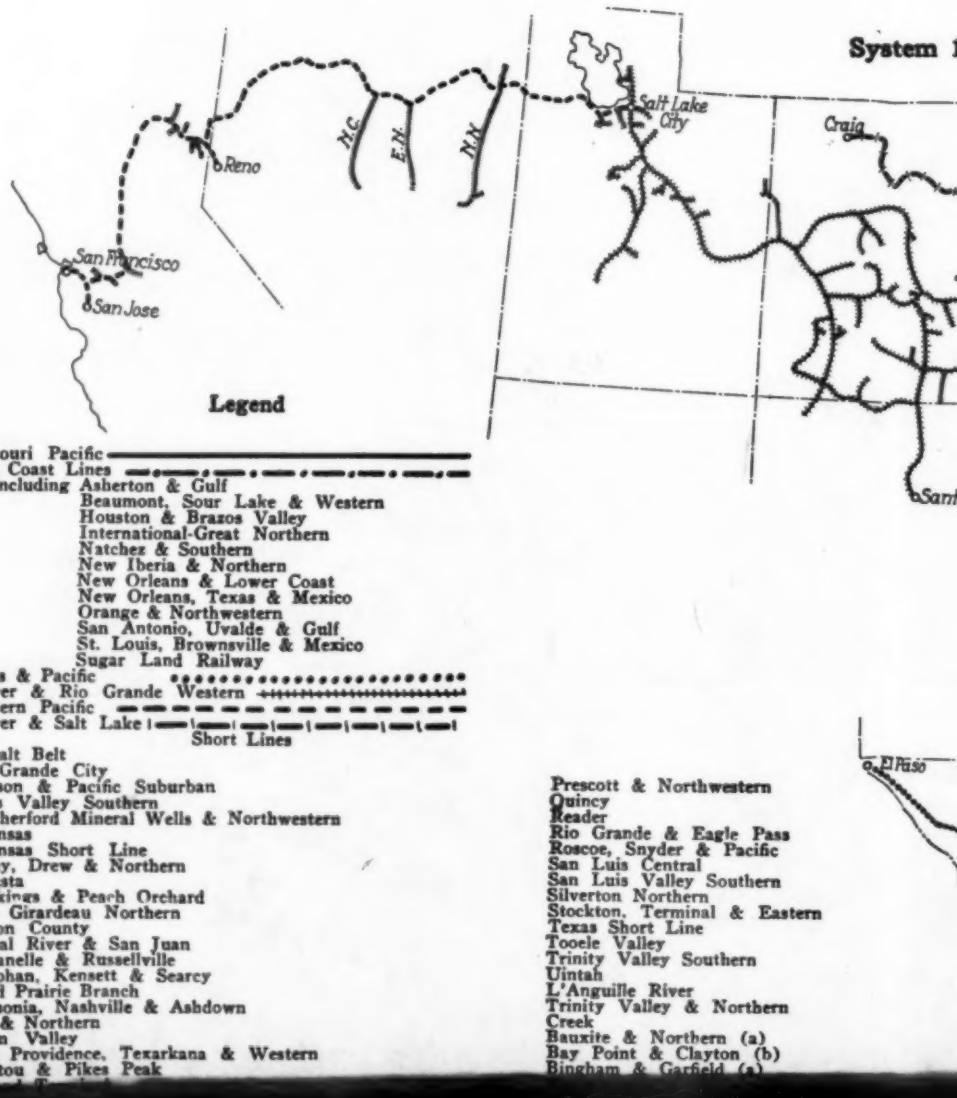
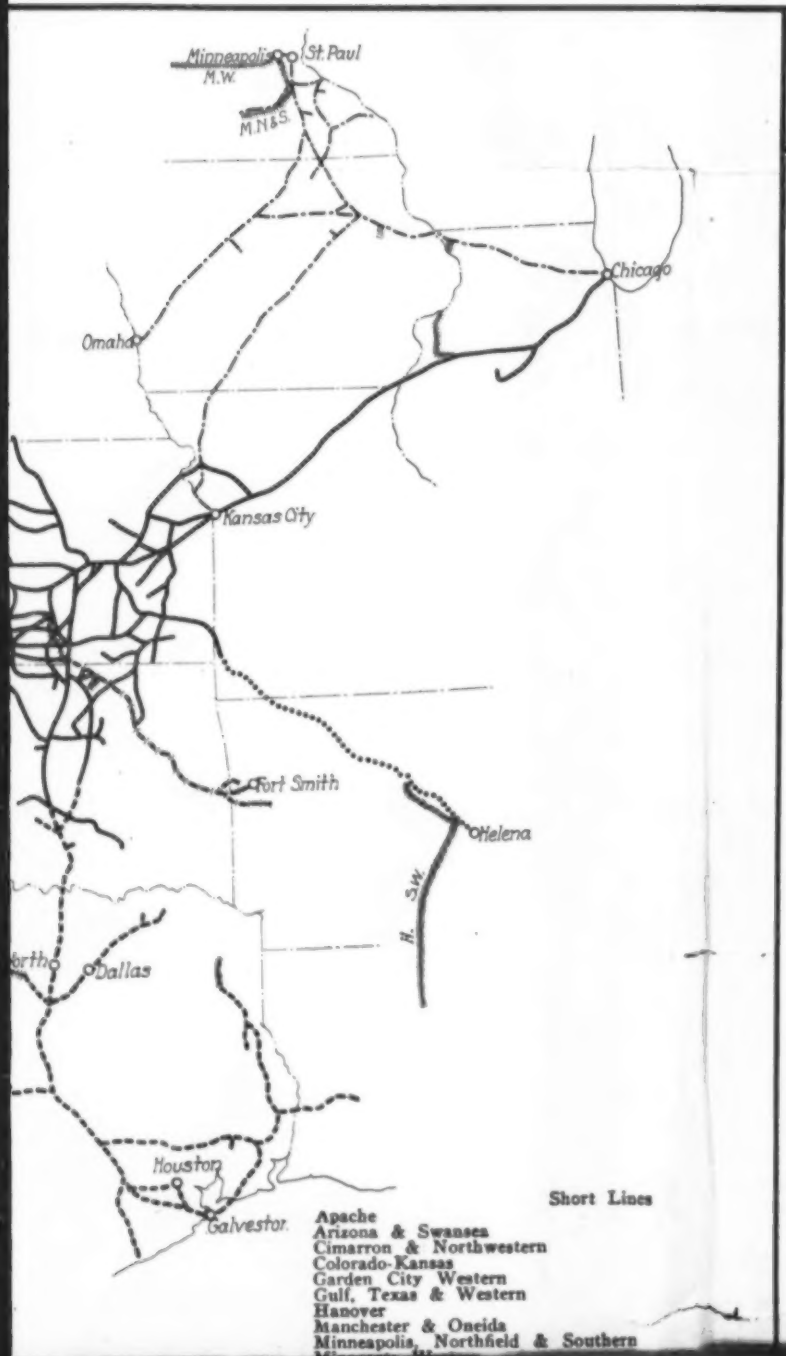
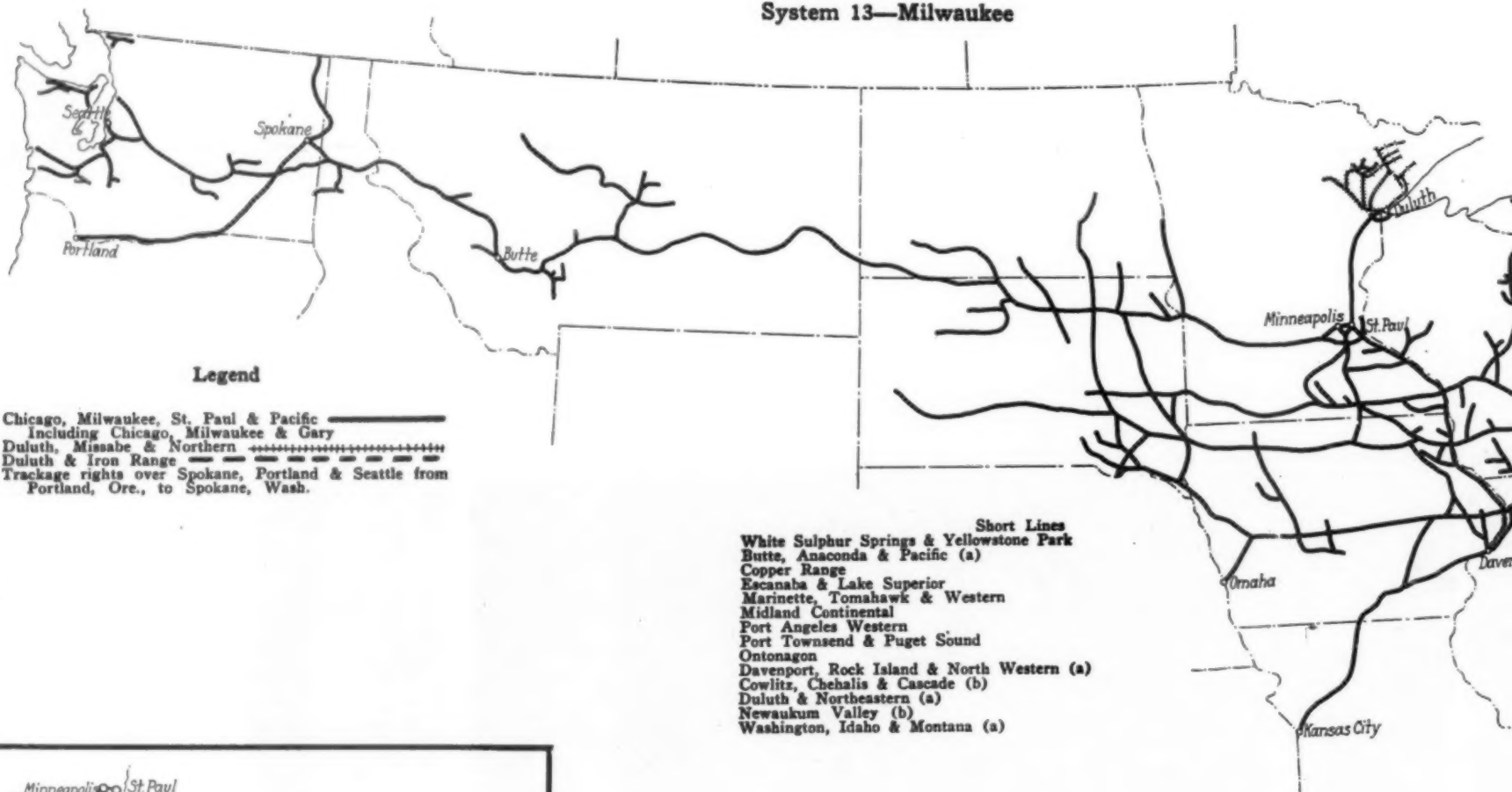
Apache
Arizona & Swansea
Cimarron & Northwestern
Colorado-Kansas
Garden City Western
Gulf, Texas & Western
Hanover
Manchester & Oneida
Minneapolis, Northfield & Southern

Nashville & At
Northwestern of
Norton & Northern
Ohio & Kentucky
Roaring Fork
Rockcastle River
Savannah & Atlanta
Tennessee, Alabama & Georgia
Tuskegee
Washington & Lincoln
Wilmington, Brunswick & Southern
Belt Line
Savannah River Terminal
Port St. Joe Dock & Terminal

East Tennessee & Western North Carolina
Elkin & Allegheny
Frankfort & Cincinnati
Gainesville & Northwestern
Gainesville Midland
Graham County
Hartwell
Lancaster & Chester
Linville River
Little River
Trans-Florida Central
Mobile & Gulf
Morgan & Fentress

South Georgia
Sumter & Choctaw
Tennessee & North
Tennessee & Kentucky
Tuckaseegee & Blue
Ware Shoals
Cincinnati, Bur
Ferdinand
Louisville, New
Interstate (a)

System 13—Milwaukee



South Georgia
Sumter & Choctaw
Tennessee
Tennessee & North Carolina
Tennessee, Kentucky & Northern
Tuckaseegee & Southeastern
Virginia Blue Ridge
Ware Shoals
Cincinnati, Burnside & Cumberland River
Ferdinand
Louisville, New Albany & Corydon
Interstate (a)



System 14—Burlington



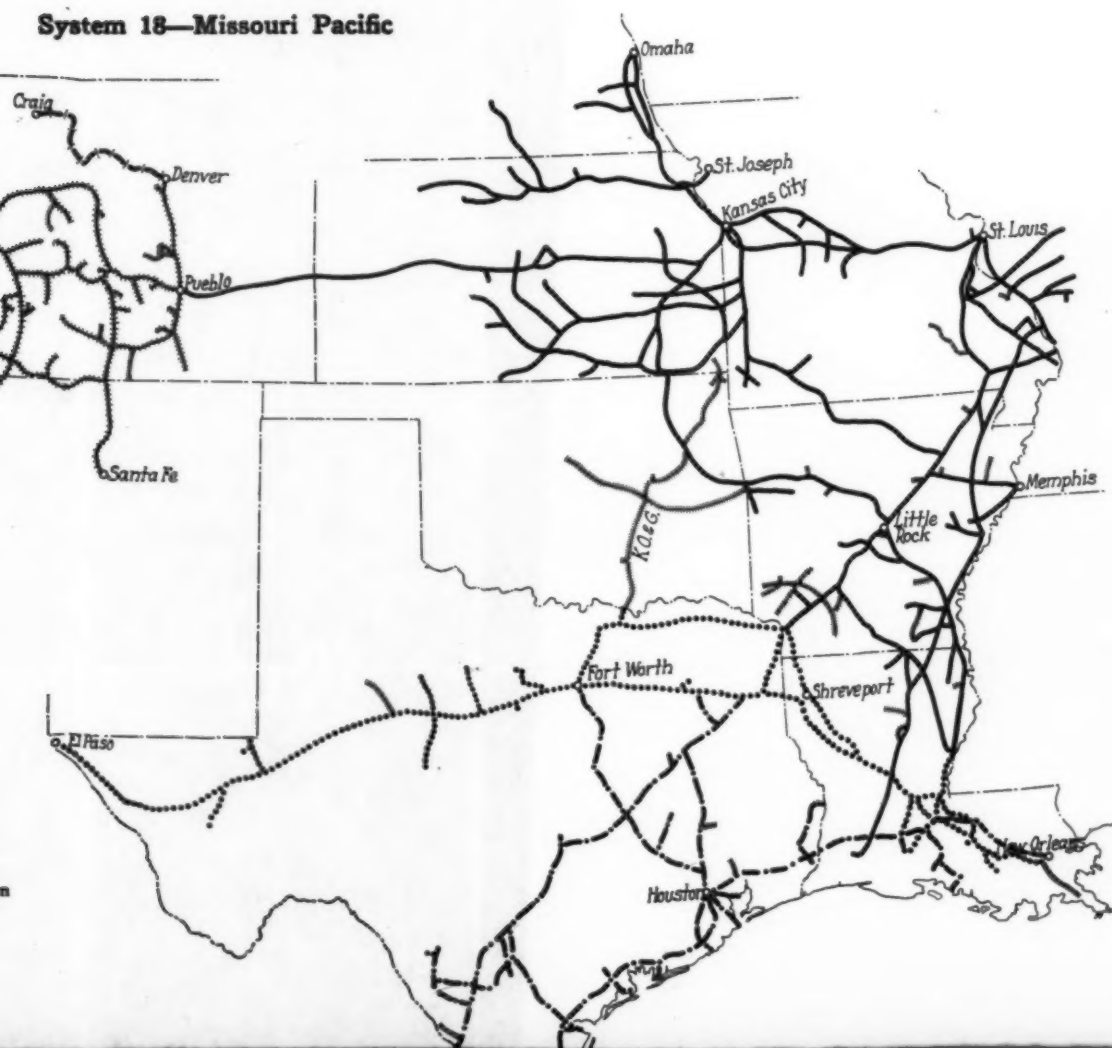
Legend

Chicago, Burlington & Quincy
Colorado & Southern
Fort Worth & Denver City
Quincy, Omaha & Kansas City
Green Bay & Western
Missouri-Kansas-Texas
Including Missouri-Kansas-Texas of Texas
Trinity & Brazos Valley (a)

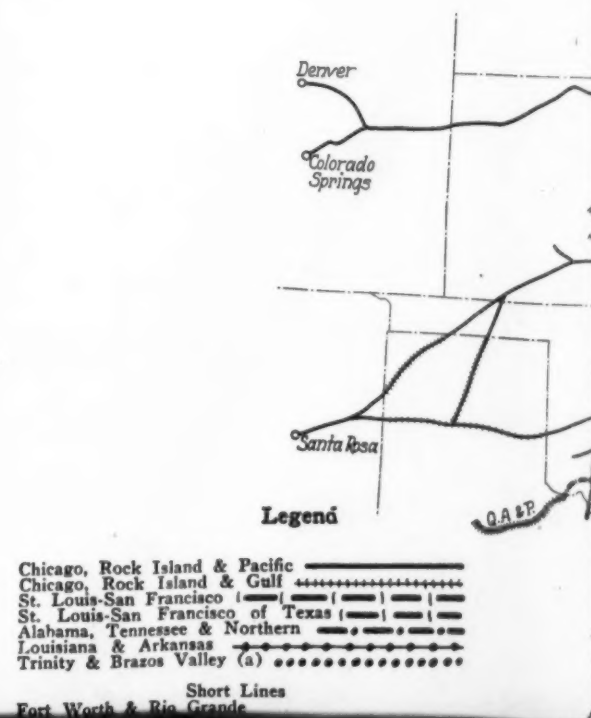
Short Lines

Ahnapee & Western
Kewaunee, Green Bay & Western
Bartlett Western
Beaver, Meade & Englewood
Bevier & Southern
Colorado & Southeastern
Colorado & Wyoming
Eastland, Wichita Falls & Gulf
Ettrick & Northern
Galesburg & Great Eastern
Hooppole, Yorktown & Tampico
La Crosse & Southeastern
Lowell & Southern
Macomb, Industry & Littleton
Oklahoma City-Ada-Atoka
Rapid City, Black Hills & Western
Roby & Northern
Rock Port, Langdon & Northern
Shelby County
Shelby Northwestern
Tabor & Northern
Wyoming
Hannibal Connecting
Winona Bridge
Davenport, Rock Island & North Western (a)
Great Western (a)

System 18—Missouri Pacific



System 19—Rock Island—Frisco



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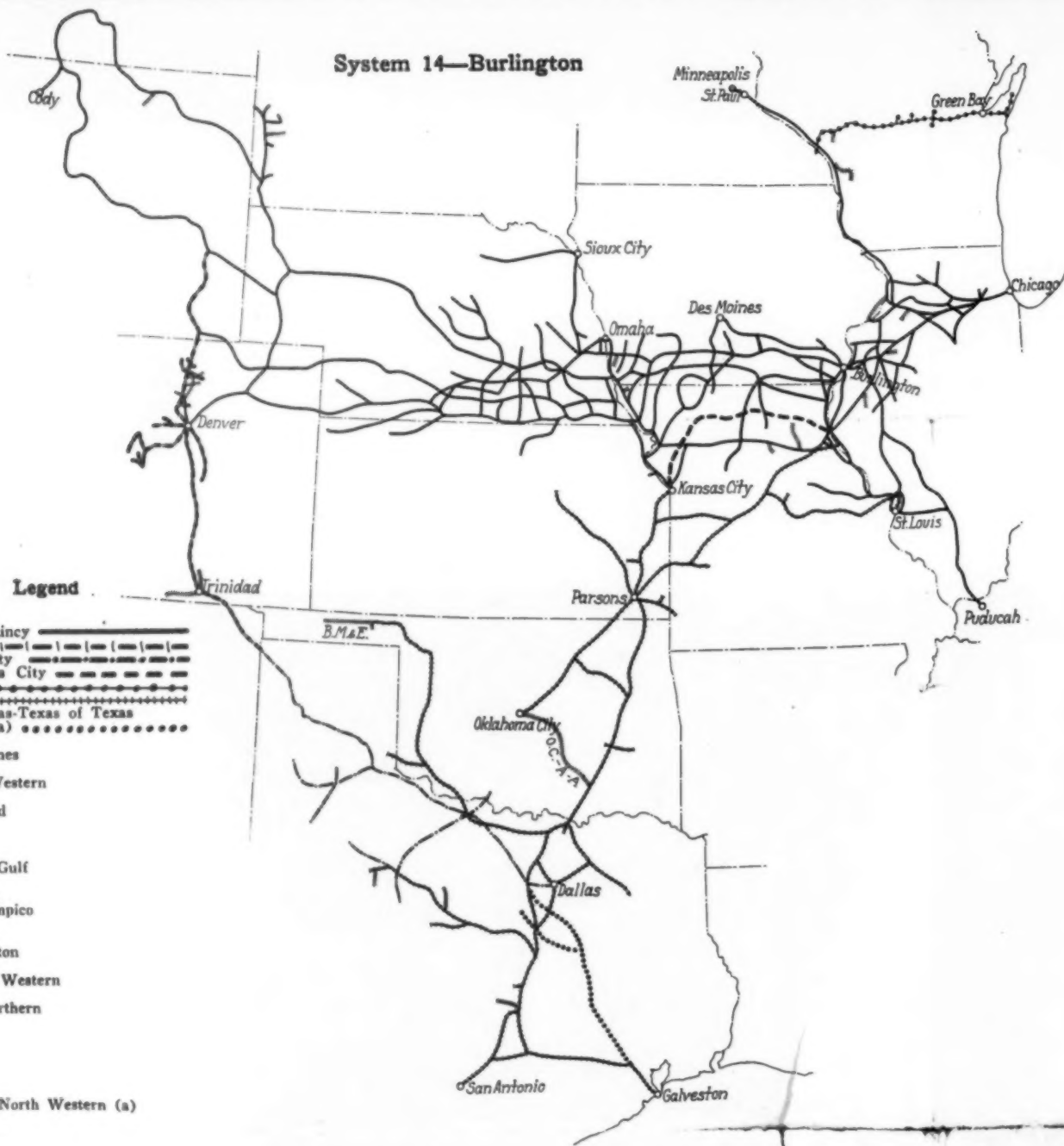
Chicago, Rock Island & Pacific
Chicago, Rock Island & Gulf
St. Louis-San Francisco
St. Louis-San Francisco of Texas
Alabama, Tennessee & Northern
Louisiana & Arkansas
Trinity & Brazos Valley (a)

Short Lines

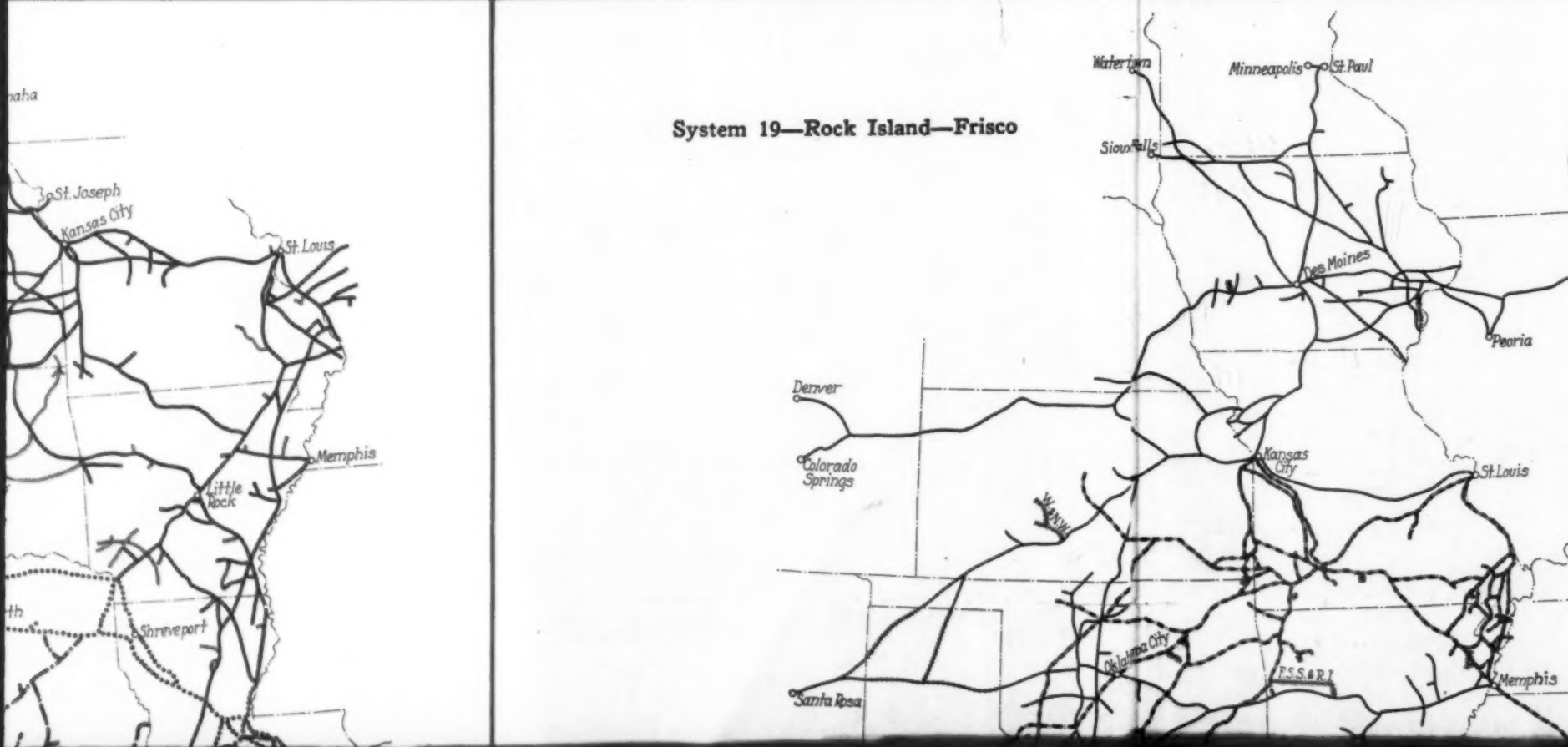
Fort Worth & Rio Grande

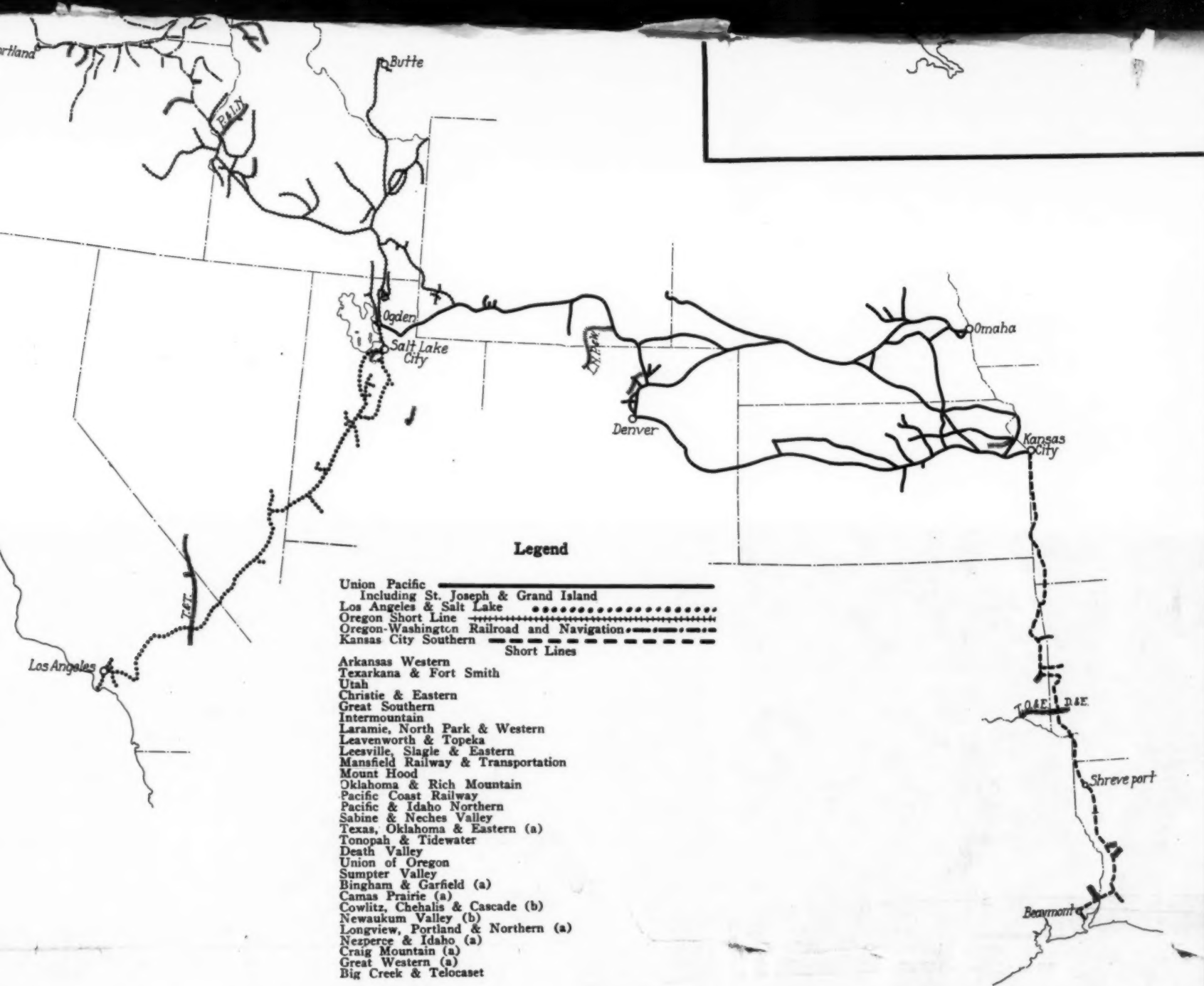
System 14—Burlington

- Legend**
- Chicago, Burlington & Quincy
 - Colorado & Southern
 - Fort Worth & Denver City
 - Quincy, Omaha & Kansas City
 - Green Bay & Western
 - Missouri-Kansas-Texas
 - Including Missouri-Kansas-Texas of Texas
 - Trinity & Brazos Valley (a)
- Short Lines**
- Ahnapee & Western
 - Kewaunee, Green Bay & Western
 - Bartlett Western
 - Beaver, Meade & Englewood
 - Bevier & Southern
 - Colorado & Southeastern
 - Colorado & Wyoming
 - Eastland, Wichita Falls & Gulf
 - Ettrick & Northern
 - Galesburg & Great Eastern
 - Hooppole, Yorktown & Tampico
 - La Crosse & Southeastern
 - Lowell & Southern
 - Macomb, Industry & Littleton
 - Oklahoma City-Ada-Atoka
 - Rapid City, Black Hills & Western
 - Ruby & Northern
 - Rock Port, Langdon & Northern
 - Shelby County
 - Shelby Northwestern
 - Tabor & Northern
 - Wyoming
 - Hannibal Connecting
 - Winona Bridge
 - Davenport, Rock Island & North Western (a)
 - Great Western (a)



System 19—Rock Island—Frisco





Railway Age

Supplement to the Issue of January 25, 1930

Plan of
The Interstate Commerce Commission
for the
Consolidation of the Railroads
Into a Limited Number of Systems



System 16—Southern Pacific

Legend

Southern Pacific —————
 Nevada-California-Oregon
 Texas & New Orleans ++++++
 Northwestern Pacific - - - - -
 San Diego & Arizona - - - - -

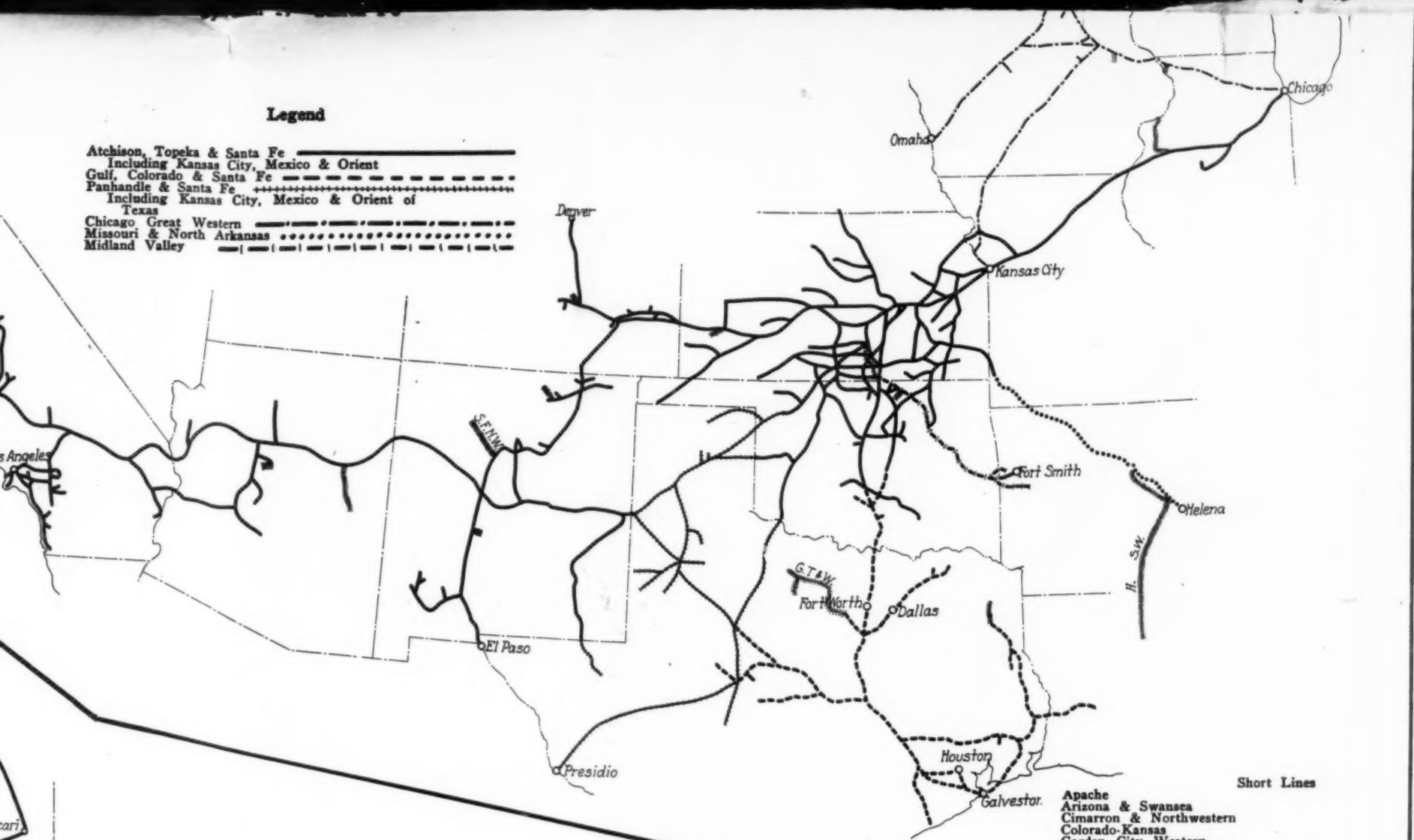
Short Lines

Sunset (a)
 Amador Central
 Angelina & Neches River
 Aransas Harbor Terminal
 Arcata & Mad River
 Arizona Southern
 Bucksport & Elk River
 California & Oregon Coast
 California Central
 California, Shasta & Eastern
 California Western Railroad & Navigation
 Camino, Placerville & Lake Tahoe
 Carlton & Coast
 Caro Northern
 Cement, Tolenas & Tidewater
 Diamond & Caldor
 East Texas & Gulf
 Fredericksburg & Northern
 Groveton, Lufkin & Northern
 Holton Inter-Urban
 Lufkin, Hemphill & Gulf
 Louisiana Southern
 Magma Arizona
 Mascot & Western
 McCloud River
 Minarets & Western
 Moscow, Camden & San Augustine
 Mt. Tamalpais & Muir Woods
 Nacogdoches & Southeastern
 Nevada Copper Belt
 Nevada County Narrow Gage
 Oregon, Pacific & Eastern
 Pacific Coast Railroad
 Pajaro Valley Consolidated
 Peninsular
 Port Isabel & Rio Grande Valley
 Ray & Gila Valley
 Rio Grande, Micolithic & Northern
 San Joaquin & Eastern
 Santa Maria Valley

Texas Southeastern
 Tonopah & Goldfield
 Uvalde & Northern
 Virginia & Truckee
 Trona
 Waco, Beaumont, Trinity & Sabine
 Tucson, Cornelia & Gila Bend
 Valley & Siletz
 Ventura County
 Williamette Valley & Coast
 Yosemite Valley
 Bay Point & Clayton (b)
 Eureka-Nevada (a)
 Nevada Central (a)
 Nevada Northern (a)
 Oregon, California & Eastern (a)
 Yreka

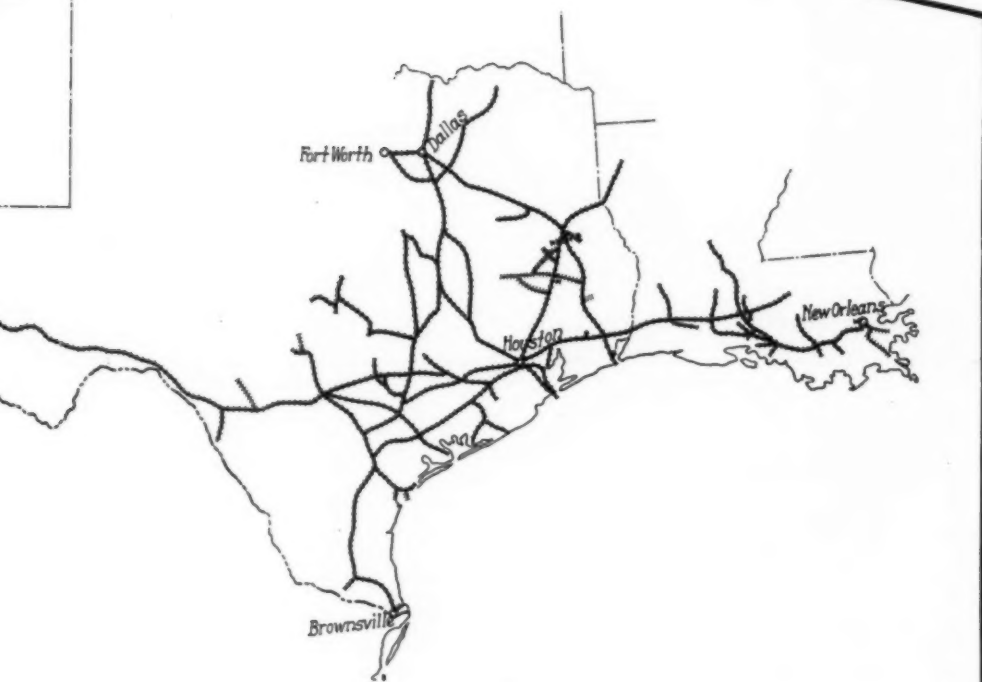
Legend

Atchison, Topeka & Santa Fe
 Including Kansas City, Mexico & Orient
 Gulf, Colorado & Santa Fe
 Panhandle & Santa Fe
 Including Kansas City, Mexico & Orient of
 Texas
 Chicago Great Western
 Missouri & North Arkansas
 Midland Valley

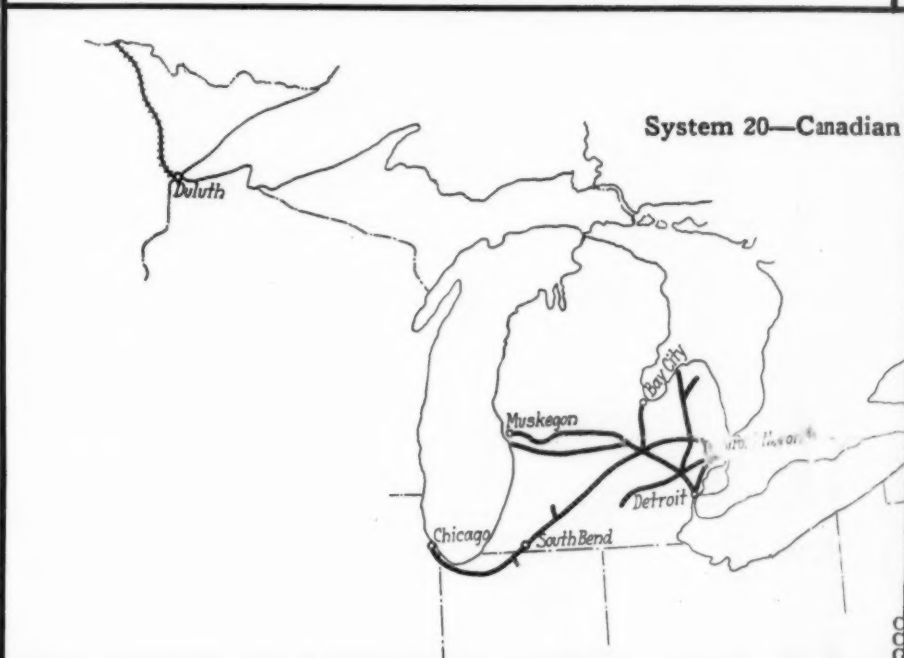


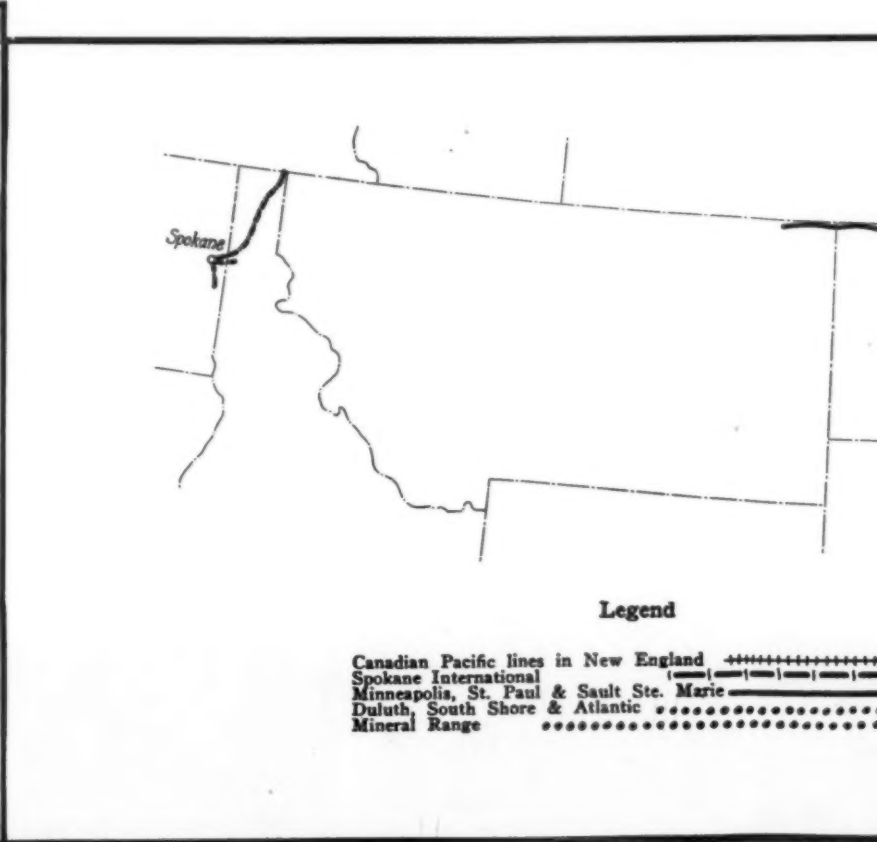
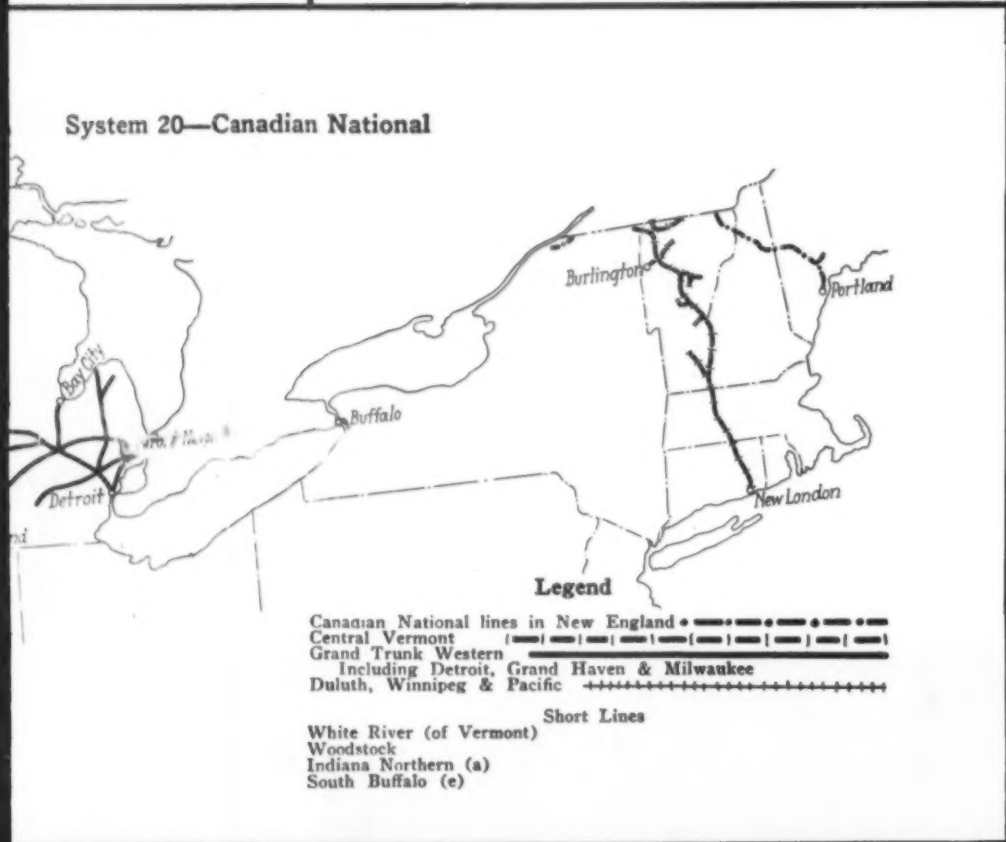
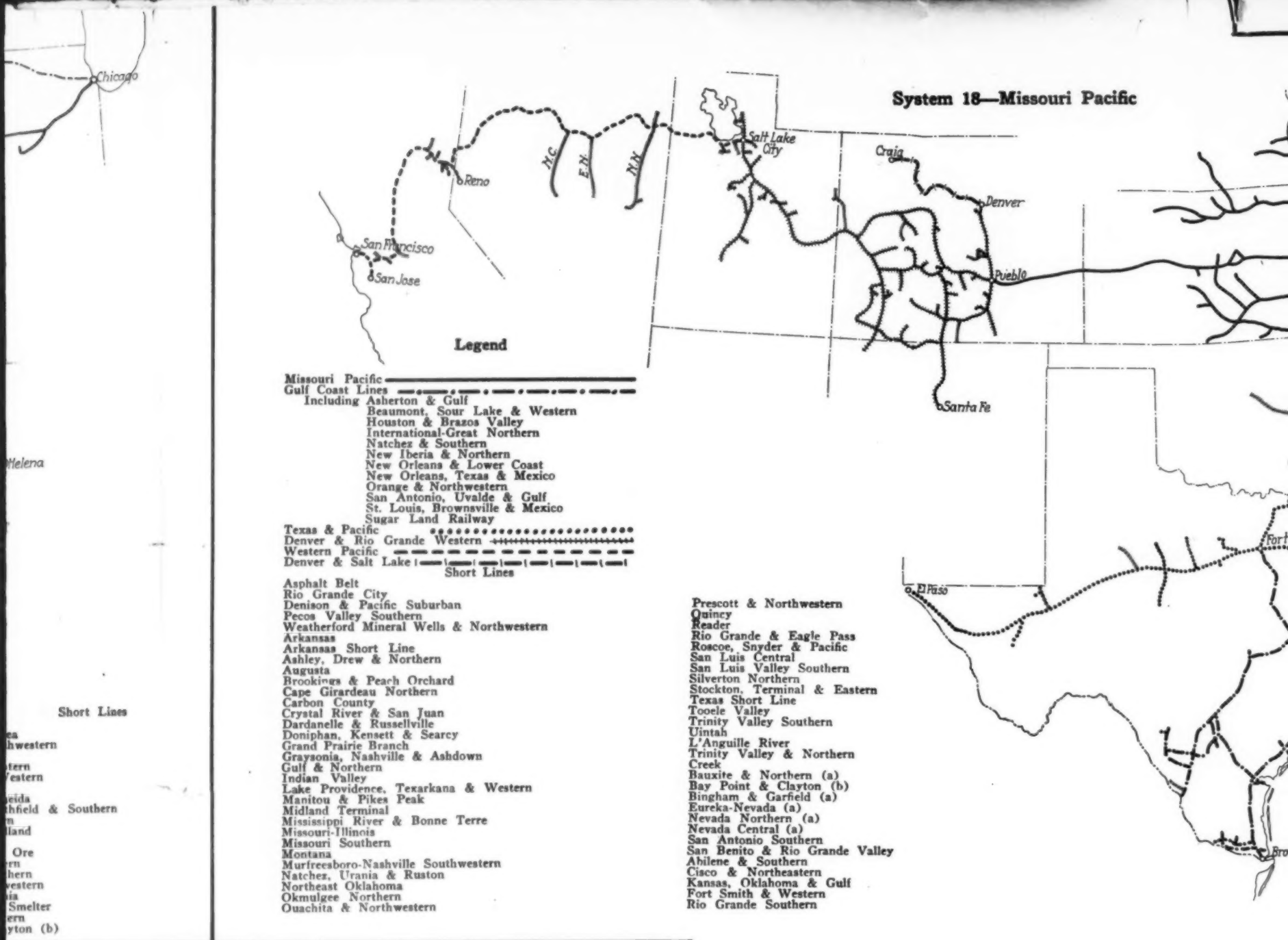
Short Lines

Apache
 Arizona & Swansea
 Cimarron & Northwestern
 Colorado-Kansas
 Garden City Western
 Gulf, Texas & Western
 Hanover
 Manchester & Oneida
 Minneapolis, Northfield & Southern
 Minnesota Western
 New Mexico Midland
 Osage
 Port Bolivar Iron Ore
 Rio Grande Eastern
 Rock Island Southern
 Santa Fe Northwestern
 Sierra of California
 Verde Tunnel & Smelter
 Helena Southwestern
 Bay Point & Clayton (b)



System 20—Canadian







System 19—Rock Island—Frisco

Legend

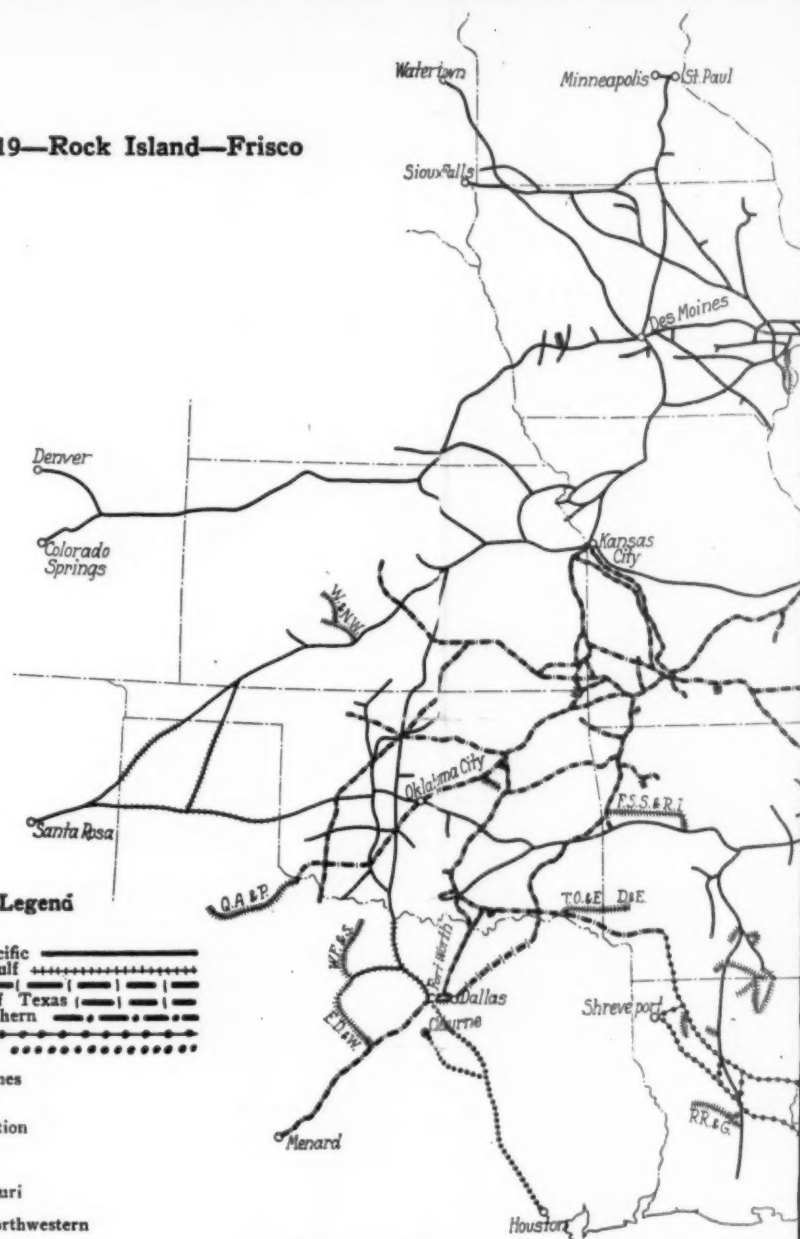
Chicago, Rock Island & Pacific
 Chicago, Rock Island & Gulf
 St. Louis-San Francisco
 St. Louis-San Francisco of Texas
 Alabama, Tennessee & Northern
 Louisiana & Arkansas
 Trinity & Brazos Valley (a)

Short Lines

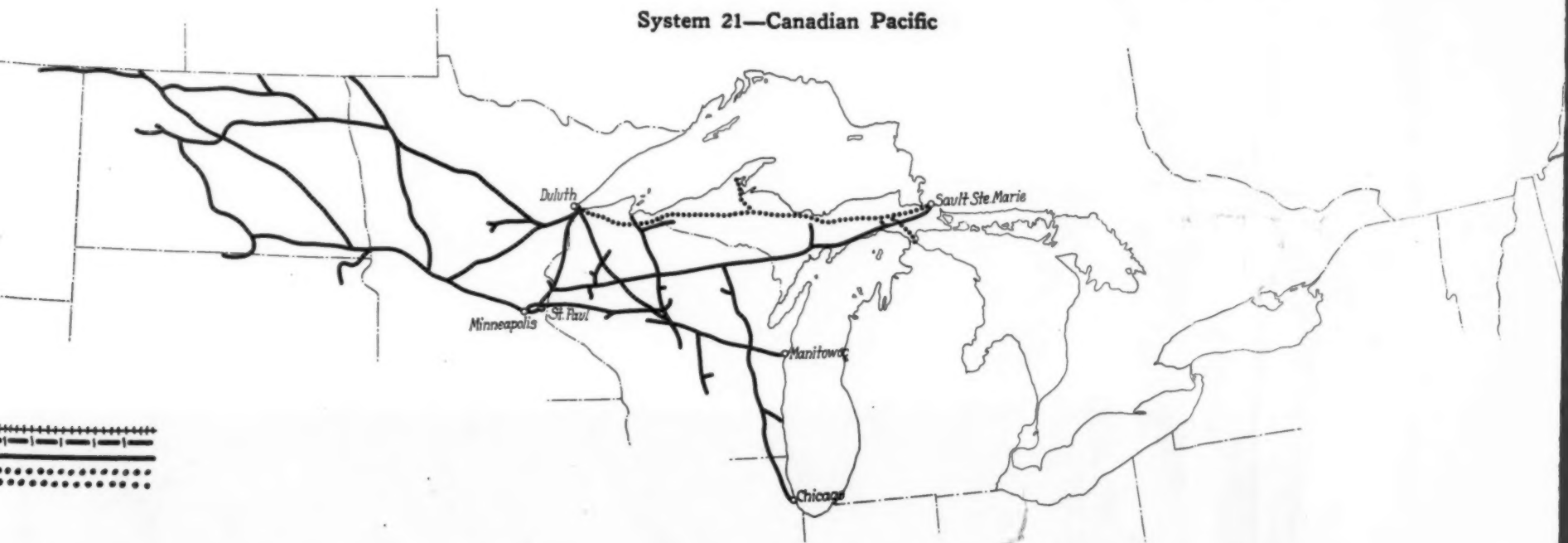
Fort Worth & Rio Grande
 Quanah, Acme & Pacific
 Louisiana Railway & Navigation
 Alabama Central
 Meridian & Bigbee River
 Mississippi
 Arkansas & Louisiana Missouri
 Atlantic Northern
 Burlington, Muscatine & Northwestern
 Cairo, Truman & Southern
 Cassville & Exeter
 Central of Arkansas
 Combs, Cass & Eastern
 DeQueen & Eastern
 Texas, Oklahoma & Eastern (a)
 El Dorado & Western
 Fort Smith, Subiaco & Rock Island
 Kansas & Oklahoma

Louisiana & Pine Bluff
 Manila & Southwestern
 Miami Mineral Belt
 Northern Louisiana & Gulf
 Ozark Southern
 Poplar Bluff & Dan River
 Red River & Gulf
 Sibley, Lake Bistenens & Southern

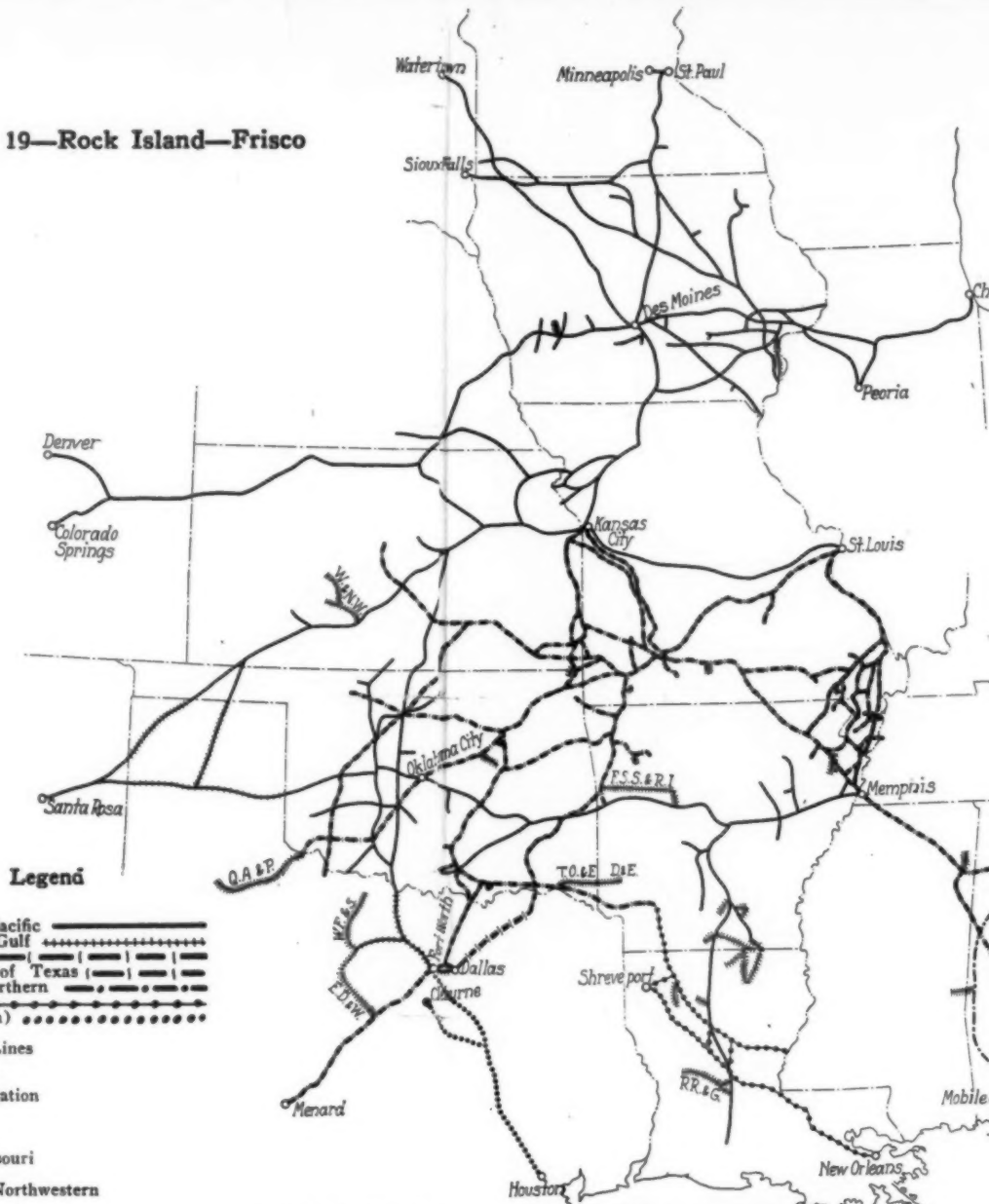
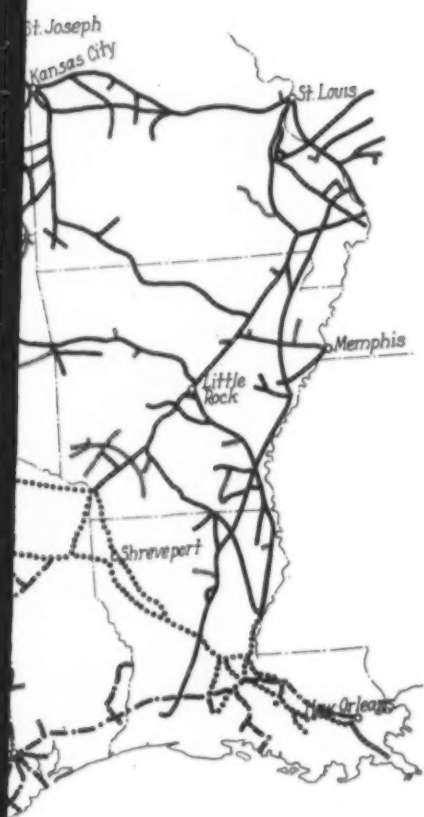
Thornton & Alexandria
 Wichita Falls & South
 Warren & Saline River
 Warren & Ouachita V
 Wichita & Northwest
 Oklahoma-Southwestern
 Oklahoma-Union
 Bauxite & Northern



System 21—Canadian Pacific



System 19—Rock Island—Frisco



Legend

Chicago, Rock Island & Pacific
 Chicago, Rock Island & Gulf
 St. Louis-San Francisco
 St. Louis-San Francisco of Texas
 Alabama, Tennessee & Northern
 Louisiana & Arkansas
 Trinity & Brazos Valley (a)

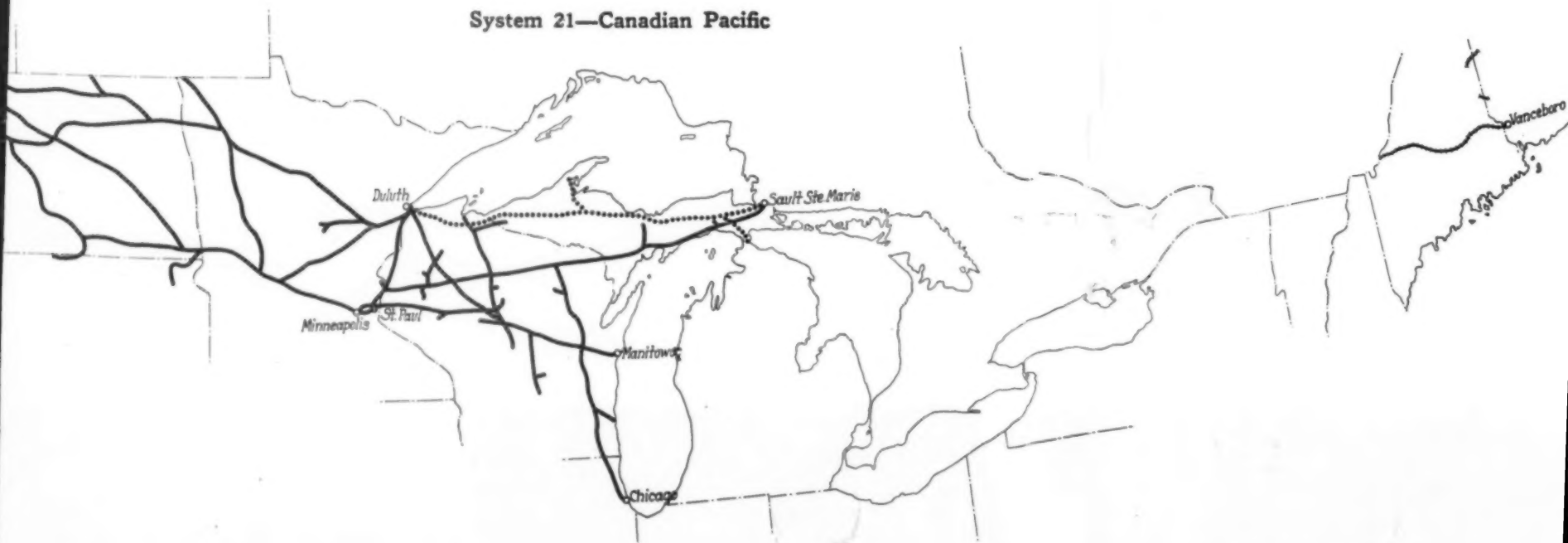
Short Lines

Fort Worth & Rio Grande
 Quanah, Acme & Pacific
 Louisiana Railway & Navigation
 Alabama Central
 Meridian & Bigbee River
 Mississippi
 Arkansas & Louisiana Missouri
 Atlantic Northern
 Burlington, Muscatine & Northwestern
 Cairo, Truman & Southern
 Cassville & Exeter
 Central of Arkansas
 Comba, Cass & Eastern
 DeQueen & Eastern
 Texas, Oklahoma & Eastern (a)
 El Dorado & Western
 Fort Smith, Subiaco & Rock Island
 Kansas & Oklahoma

Louisiana & Pine Bluff
 Manila & Southwestern
 Miami Mineral Belt
 Northern Louisiana & Gulf
 Ozark Southern
 Poplar Bluff & Dan River
 Red River & Gulf
 Sibley, Lake Bisteneau & Southern

Thornton & Alexandria
 Wichita Falls & Southern
 Warren & Saline River
 Warren & Ouachita Valley
 Wichita & Northwestern
 Oklahoma-Southwestern
 Oklahoma-Union
 Bauxite & Northern (a)

System 21—Canadian Pacific



Railway Age

Supplement to the Issue of January 25, 1930

Plan of
The Interstate Commerce Commission
for the
Consolidation of the Railroads
Into a Limited Number of Systems

Adopted on December 9, 1929

THE SYSTEMS

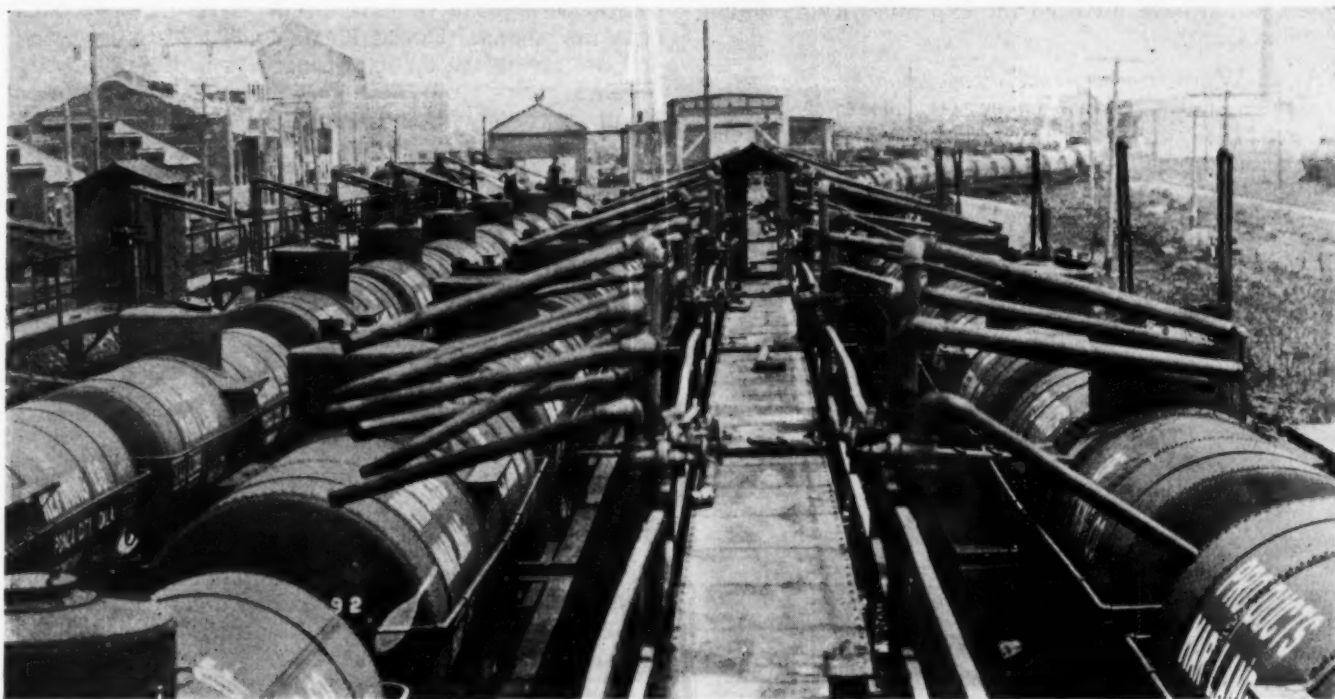
- | | |
|---|---|
| System 1—Boston & Maine | System 11—Chicago & North Western |
| System 2—New Haven | System 12—Great Northern—Northern Pacific |
| System 3—New York Central | System 13—Milwaukee |
| System 4—Pennsylvania | System 14—Burlington |
| System 5—Baltimore & Ohio | System 15—Union Pacific |
| System 6—Chesapeake & Ohio—Nickel Plate | System 16—Southern Pacific |
| System 7—Wabash Seaboard | System 17—Santa Fe |
| System 8—Atlantic Coast Line | System 18—Missouri Pacific |
| System 9—Southern | System 19—Rock Island—Frisco |
| System 10—Illinois Central | System 20—Canadian National |
| | System 21—Canadian Pacific |

References

Short lines in all systems: 

- | | |
|-----------------------------------|----------------------------------|
| (a) Undivided one-half interest | (d) Undivided one-fifth interest |
| (b) Undivided one-third interest | (e) Undivided one-sixth interest |
| (c) Undivided one-fourth interest | (f) Undivided two-third interest |

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Loading Tank Cars at a Refinery in Oklahoma

Railways Enable Oil Industry to Increase Use of Tank Cars *

*Elimination of car shortages stabilizes coal prices—
Improved service benefits not as marked in
packing and dairy industries*

Part III

AN effect of improved railway freight service upon business to which attention had not previously been called was disclosed in replies to the *Railway Age* inquiry from the oil industry, particularly the owners and lessees of tank cars. The opportunity that expedited freight service has given tank car owners to greatly reduce their rolling stock investment per unit of commodity transported appears to be as important to that industry as the reduction in inventories is to the manufacturer and jobber. Part III of this series of articles will also cover the advantages and some of the disadvantages which have accrued to the mining industry and manufacturers and distributors of dairy and meat products, miscellaneous products such as beverages and tobacco, and household luxuries such as radios.

As was briefly mentioned in Part I, letters from oil companies show that the average tank car is today doing the work which required nearly two tank cars six or seven years ago. This benefit alone has resulted in the saving of millions of dollars of capital to the oil industry. While in part the increased efficiency of the tank

car is due to the introduction of tanks of larger capacity, it is mainly attributable to an increased car mileage per day.

How the Oil Industry Has Benefited

Among the letters received from oil companies are the following:

E. W. Sinclair, president, *Sinclair Consolidated Oil Corporation*, New York.—The increased efficiency in railroad transportation has resulted in large savings to this company. This is clearly indicated by a comparison of car loadings in 1922 and 1928. The volume of our commodities loaded into cars in the latter year showed an increase of approximately 196 per cent, although the average number of cars in service was only 17.9 per cent greater than in 1922. This gain in loading efficiency was due to the fact that the average mileage per car per day increased 69.5 per cent. As a result, we were enabled to reduce very materially the stocks carried in our various warehouses, this reduction making it unnecessary to purchase additional equipment and additional facilities

* Other articles in this series on the results of improved railway service appeared in *Railway Age* of recent date as follows: Part I, January 11, page 153; Part II, January 18, page 195.

which would have involved the expenditure of millions of dollars.

A. F. Winn, *traffic department manager, Skelly Oil Company, Tulsa, Okla.*—During the span from 1922 through 1928 this company's tank car shipments increased more than 300 per cent while the number of company-owned cars was just about doubled; the number of extra cars under lease as averaged over each year of this period having remained practically stationary, which means, of course, that the rail service in that span has improved to an extent that by doubling the rolling stock we were enabled to treble the volume of business done.

While this company carries rather large sized stocks at warehouses the business done in those warehouses has been continually on the increase. Our lubricating oil business is a comparatively new venture which has been building up over the last few years, and it would be difficult to put one's finger on the comparison in the volume of stocks carried at warehouses, though it may be stated generally that, by reason of the extraordinarily good transportation service, if we had been operating on the same volume in 1922 as at present there would be a reduction in the amount of stocks carried now, as against 1922, of probably 25 per cent, which amounts to considerable in dollars and cents.

Henry M. Dawes, *president* and **Henry Hauseman**, *traffic manager, Pure Oil Company, Chicago.*—Particularly, with respect to oil field supplies, it is true that requisitions are not made and purchase orders placed until the need is present; such supplies then move from the point of manufacture to the destination with dependable promptness. It would follow from this that there should be a tendency toward reduction in the account "Material and Supplies." For the company as a whole, that item as of December 31, 1921, approximated two million dollars; on December 31, 1928, it was three and one-half million. The explanation of the increase is, perhaps, traced to the general expansion and growth of the company in intervening years.

We have another factor which makes our industry peculiarly sensitive to variations in railway service. Approximately 97 per cent of our outbound tonnage moves in tank cars under railway tariffs which place on the shipper the burden of furnishing the railway equipment. We meet that burden through investment and lease of railway cars, and the burden is made easier by quicker and dependable service in that such improved service tends to decrease the number of cars required.

However, the movement of products from refineries is neither constant nor continuous. Variations in manufacture, weather conditions, price, seasonal fluctuations in demand, prevent an even and orderly rate of shipment.

During this period, 1922 to 1928, to which reference is made, our own company entered an era of expansion. New shipping points have been established; the marketing of petroleum oil has been, to some extent, localized, i.e., the area of distribution constricted, thus tending to shorten the rail hauls. Keeping these conditions in mind, the following statistics are cited:

| Year | Cars Operated | Miles Per Day | Loads Carried | Loads per Car Operated |
|------|---------------|---------------|---------------|------------------------|
| 1921 | 1707 | 28 | 20008 | 11.7 |
| 1922 | 1758 | 31 | 22901 | 13.0 |
| 1923 | 2084 | 37 | 29670 | 14.2 |
| 1924 | 2638 | 32 | 35138 | 13.3 |
| 1925 | 2868 | 34 | 38814 | 13.6 |
| 1926 | 2680 | 31 | 35967 | 13.4 |
| 1927 | 2657 | 49 | 52589 | 19.8 |
| 1928 | 2632 | 48 | 55605 | 21.1 |

The number of days on the round trip is an important factor in gaging car supply. Of all of our shipping

points, perhaps there have been fewer factors which make for change than at Heath and at Muskogee, and so I am giving the tabulation of days in the round trip for these years. But, here too, other factors enter, viz., the promptness with which consignees unload, and insofar as the Oklahoma refineries are concerned the fact that we no longer operate marketing stations in Montana and in Washington:

| Year | Heath | Ardmore, Cushing |
|------|-------|------------------|
| 1921 | 14 | 34 |
| 1922 | 13 | 26 |
| 1923 | 13 | 24 |
| 1924 | 11 | 24 |
| 1925 | 10 | 26 |
| 1926 | 10 | Ard. 24 Musk. 21 |
| 1927 | 9 | Ard. 21 Musk. 17 |
| 1928 | 9 | Ard. 19 Musk. 16 |

In the month of July, 1929, 140 tank cars in service handled out of our Savannah terminal 477 loads. The average haul was 252 miles.

Our company has made no purchase of railway equipment since 1924. The factors, larger output through marketing stations, increase in their number and capacity, the shortening of hauls, prompt unloading and improved railway service, have up to this time permitted the conduct of our operations without permanent increase of tank car equipment.

A dredging machine urgently needed at Lost Lake left Erie, Pa., on the evening of October 26 and arrived at Houston on the morning of November 2—a distance of approximately 1,600 miles, with the time in transit, 5½ days. How can we measure the value of that service? On the other hand, we have found it necessary in recent months to discipline certain carriers because of poor service.

As a result of the improved service an item which is of peculiar interest to our company as an owner of tank cars is that the powerful locomotives, longer trains with heavier modern equipment and increased speed, place unusual and heavy strains on the older cars, which in consequence, more quickly approach a state of obsolescence.

G. W. Reid, *manager of the marketing and traffic department, Panhandle Refining Company, Wichita Falls, Tex.*—The increased service of railroads has permitted us to cut down our tank car investment about 20 per cent. Some say as high as 40 per cent or even 50 per cent, but we are certain it has been cut 20 per cent. The investment in inventories has been kept far below what it would have been had we been in the marketing end of the industry 10 years ago.

W. W. McFarland, *president, Warner-Quinlan Co. (petroleum producers and refiners), New York.*—In the movement of company-owned cars we have found a great improvement. Some time ago some of the leading eastern roads undertook to handle tank cars, both light and loaded, on their very fast trains with the result that the car made a round trip to Chicago in something like 10 days less time than formerly consumed. We have roughly estimated that by the preferred service given by some carriers, actual equipment need, say on a Chicago run, would be reduced by one third. This is a substantial saving in outlay for equipment and we have found that by confining our shipments to lines giving preferred movement on both light and loaded tank cars we have saved considerable money yearly.

D. J. Moran, *president, Continental Oil Company, Ponca City, Okla.*—From the standpoint of the oil industry, the railroads have been a great factor in establishing a relationship between the oil company and the consumer that would not have been possible were it not

for the fact that the railroads have improved their service in step with a rapidly improving transportation age. It has meant to us a limited amount of storage for gasoline and other oils at all points, for we now can definitely tell in hours when a tank car of our products will be delivered at any point on a reputable and well-managed railroad.

R. R. Irwin, *president, White Eagle Oil and Refining Company, Kansas City, Mo.*—We have, with others, noted and experienced marked improvement of service, in the period mentioned (since 1923). Prior to that time the service was almost impossible and at times, demoralized. There was no way to budget performance of cars or plan a supply to take care of the season's demand. We find that this is possible now, although we have some local conditions that upset our shipping budgets.

The improved service with its dependability has its greatest value in decreasing the number of cars required to handle a specific volume of business. Another improvement which perhaps goes with improved movement of cars is the more prompt and definite advice of location of cars by railroad car tracing departments. We have been able to discontinue the practice of locating our own car tracer at important terminals.

C. M. Fuller, *president, Richfield Oil Company of California, Los Angeles, Cal.*—There is one item in the petroleum industry wherein the railroad plays a most important part, and that is the expeditious movement of owned and leased tank car equipment, both loaded and empty. It has been our individual experience that since 1923 we have been able to get more mileage in the movement of our tank car equipment, all of which has a direct bearing on the number of units of equipment that it is necessary for us to employ in the transportation of our products.

Axtell J. Byles, *president, Tide Water Associated Oil Company, New York.*—The increased efficiency of the rail carriers releases money for other uses which was previously required to carry inventories of materials and stocks necessary for the conduct of our business.

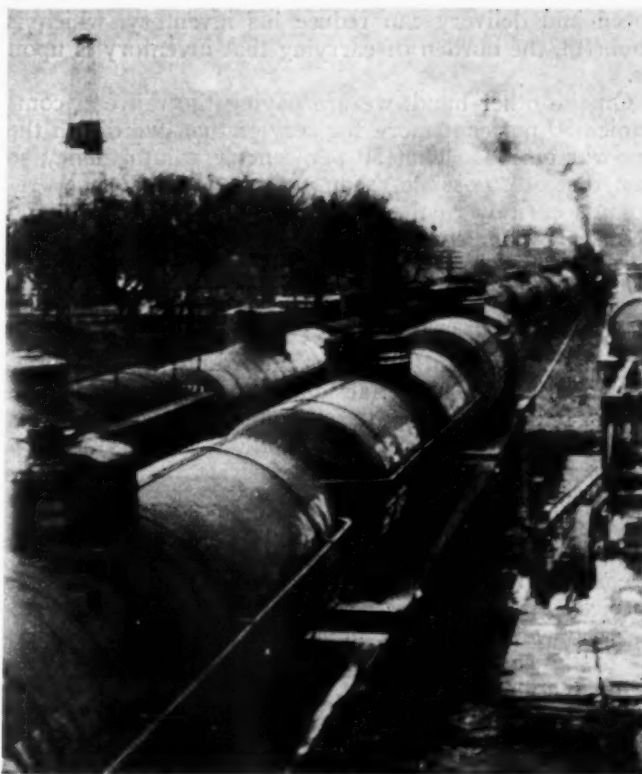
Mining Industry Notes Service Benefits

While the benefits received by the mining industry in general do not appear to have been as great as those received by other industries, because of the slight dependence upon expedited service for movement of coal and ore, one coal mining concern credits railway service with having stabilized that industry.

These letters from mining company officers include replies from the following:

Clinton H. Crane, *president, St. Joseph Lead Company, New York.*—At the present time our inventory of materials and supplies is somewhat higher than it was in 1920-21, but likewise the production of our mines is considerably greater. The amount of inventory carried has decreased \$1.78 per ton of ore mined, and, assuming that approximately 50 per cent of this saving is due to increased efficiency on the part of our management and the remainder is due to improved transportation, it would show a saving by reason of this improved service of over \$18,000 per year in interest charges.

On the basis of per ton of ore mined we show a saving of 0.5425 cents per ton in our fuel inventory account and on the same basis as above this would show a saving in interest charges of roughly \$6,000 per year. A considerable portion of our lead is shipped in carload



A Train of Tank Cars Leaving the Seminole (Okla.) Oil Field on the Rock Island

lots and under the terms "Cash due on arrival at destination." The increased efficiency of the railroads has meant a gain in many cases of five to seven days in collections since 1920-1922 with the resulting saving in working capital.

J. W. Searles, *president, Pennsylvania Coal and Coke Corporation, New York.*—The improvement in rail transportation has changed the bituminous coal mining business materially, and has been valuable, in that it has checked the violent fluctuations in price due to car shortages, and the heavy stocking due to fear of shortages with the inevitable period of depression following while excess stocks are being worked off. It has helped to concentrate production at the most economical mines, and to close down many mines which were kept up merely that they might receive their quota of cars during times of transportation difficulties. It is helping to stabilize the industry.

Donald A. Callahan, *president, Callahan Zinc-Lead Company, Wallace, Idaho.*—The metal mines furnish a considerable part of the Tonnage carried by all of the railways and there is a decided advantage in having that tonnage transported expeditiously. The metal mines are users of a tremendous tonnage of machinery. It is a decided advantage to be as close to the sources of supply of the iron and steel industry as possible. Each improvement in transportation brings the mines of this intermountain country closer to the steel mills, consequently eliminating many losses that might occur by reason of delay in shipments.

Gordon R. Campbell, *president, Calumet and Arizona Mining Company, Calumet, Mich.*—Our railroad service has at all times been satisfactory and profitable to the railroad companies tributary to our properties. We produce a selling raw material so that if the purchaser of the raw material on account of increased

speed and delivery can reduce his inventory, which is doubtful, the burden of carrying that inventory is upon us.

On the other hand, we are paying the railroad companies 50 per cent more for service than we did in the pre-war period. That 50 per cent runs into money so fast that any possible credit to increased efficiency redounds entirely to the advantage of the railroads and is borne by our company and others similarly situated.

Edward H. Lang, *general traffic manager, Anaconda Copper Mining Company*, New York.—Our transportation in the main is long haul carload traffic from mines to the smelters and refineries, affording the carriers a constant flow of materials and supplies and any temporary delay in transportation could be bridged over because of the necessity in our operations of carrying large stocks at the source, or at the refineries.

Our products are not perishable and while improved service is helpful and desirable, it has been generally felt by the carriers that the product of mines is more of a convenience commodity and not subject to special service. We have no hesitancy in making the statement, however, that the improved railway freight service of the country has contributed largely to the growth of our national prosperity.

James MacNaughton, *president, Calumet and Hecla Consolidated Copper Company*, Calumet, Mich.—While there has been material improvement, there is no specific outstanding incident to which attention can be called or on which any particular saving either in rail freights or in expedition of delivering freight can be based. Such service in this locality has been better than in most places over a long period of years.

The Effect of Improved Service on the Packing and Dairy Industries

In the meat packing and dairy products industries letters indicate that the benefits of improved freight service have not been as widespread as among other classes of concerns. While some complaint is made as to the rate structure under which certain products are shipped, an outstanding reason why they have not benefited so greatly is because refrigerated products have for a long period of years been given expedited train movements. Included in the replies from those companies were the following:

F. Edson White, *president, Armour and Company*, Chicago.—It is a question whether the increase in carriers' efficiency has not resulted detrimentally to the packing industry as a whole. The far greater improvement for 1922 in service rendered live stock moving long distances for slaughter than has occurred in the service of handling the products, is a serious handicap to the packers endeavoring to operate plants close to the area of live stock production. In fact, we find ourselves now confronted not only with a service for live stock transportation superior to any heretofore offered to our Eastern competitors or to us on our products, but with live stock rates to far distant consuming centers relatively more favorable to Eastern slaughtering than ever before.

From the standpoint of sound economics, the railroads should not be inimical to the conversion of raw materials into finished products in the territory where those raw materials are produced. Conceding the fairness of this premise certainly no handicap should be placed on the Western manufacturer either through the

existence of service or a rate adjustment more favorable to the raw materials than to the finished products.

Thos. H. McInnerney, *president, National Dairy Products Corporation*, New York.—This efficiency on the part of the railroads is directly reflected to the shipper and receiver and makes possible large savings in both manufacturing and storage inventory and these savings can hardly be measured in terms of dollars and cents. This may best be illustrated by citing the conditions obtaining in one of the many units of this organization.

In 1923, there was a lack of faith on our part in the ability of the railroad carriers to perform a constant, dependable service and it was, therefore, necessary to carry a stock of milk bottles far in excess of actual requirements. Since the carriers have proven their ability to meet all emergencies without interruption of traffic, this unit has been able to reduce its inventories approximately 50 per cent.

E. F. Scott, *traffic manager, Beatrice Creamery Company*, Chicago.—We have not benefited from the general improvement of transportation service to the same extent as many lines of business. Our traffic, being of a highly perishable nature, has always paid the highest freight rates and has always been given a service somewhat superior to the ordinary run of traffic, and the improvements in service of given dairy traffic as compared with pre-war days, have not been so marked as the improvement in the so-called "dead freight service."

For instance, we had third morning delivery at New York from Chicago on our traffic prior to the war, and we have third morning delivery at the present time. Our warehousing and storage problem is one that is subject to nature and the seasons. We must store our products in large quantities during the periods of seasonable production, and distribute them during the seasons of small production.

On the other hand, we have suffered somewhat keenly from the curtailment in local passenger train service in recent years due to the fact that our raw material in the production of butter moves in passenger train service, and the decided curtailment in this service has had an adverse effect on our cream procurement departments. We have also been affected by the action of several of the railroads in building new cold storage facilities at points where ample facilities of that nature already existed.

We have had a decided reduction in our loss and damage claims due to better handling, but here too the railroads only partially contributed to the improvement. Our greatest claim reduction has been in the handling of eggs and most of the reduction accomplished resulted from improved and more expensive packing developed and adopted by the shippers.

Radio Manufacturers Appreciate Improvement in Service

The letters from radio, phonograph and household furnishing manufacturers follow:

J. G. Harbord, *president, Radio Corporation of America*, New York.—The most marked improvement in railroad service which affects us is that in the case of the "less than carload" shipments, because we use that method to a great extent in transporting our goods to our wholesale distributors. Expedited railroad service is essential to the proper conduct of the radio business, since not only is our business seasonal, but new models

brought out from time to time, require rapid distribution to all parts of the country so that they may be introduced simultaneously all over the United States. The success that we feel that this corporation has had in this effort is ample testimony to the increase in good service of the railroads of the United States.

H. C. Cox, *president*, and **L. R. Ahern**, *traffic manager*, *Columbia Phonograph Company*, New York.—A comparison between the service in the year 1922 and the service in the year 1928 shows that because of the accuracy of the freight schedules at the present time we are now shipping thousands of pounds by freight which formerly went by some other means of transportation. The time required for goods to reach their destination



Loading Dairy Products in a Refrigerator Car at an L. C. I. Freight Station

is now known and our branches and jobbers all over the United States are therefore in a position to order by freight.

The improvement in the handling of freight is also a big factor as the railroads now permit us to ship records in lighter weight packing material at a saving of thousands of dollars, whereas, several years ago the railroads would not accept our product in the present day packages. This has also contributed to economical transportation because our claims for the entire year 1928 for loss and damage against the railway companies are 80 per cent less than they were in 1922.

P. E. Anderson, *traffic department*, *Zenith Radio Corporation*, Chicago.—We have noted particularly that we can now more easily obtain cars of the size and type ordered. We note also the shortened time in transit made possible by more modern equipment and operating methods. Three years ago it required nine days to ship a carload to the Pacific Coast, while today we find a schedule of seven days is adequate. Likewise, time in transit to Eastern points is shortened, and additional cleanup trains leaving 12 hours behind scheduled trains are able to make delivery at destination at the same time.

F. H. Truax, *director of traffic*, *Simmons Company* (*beds and mattresses*), New York.—Transportation service naturally is a major factor in our scheme of distribution. The furnishing of suitable railway equipment at the time required, plus the prompt handling of shipments in transit, contributes in a large measure to the efficient operation of our works and service stations throughout the country as this results in reliable and economical service to our dealers. We feel that the character of railway service rendered during the past

few years has been very largely responsible for the healthy business condition of the country.

Frank E. Smith, *president*, *Servel, Inc.* (*refrigerators, automobile bodies and gasoline engines*), New York.—Railroad transportation today is more efficient than ever before and the saving of time in hauling freight, i.e., the greater mileage per car per day, has had a most beneficial effect on business generally and is also reflected in the profitable operations of the railroads themselves. As a purchaser of large quantities of material, and as a shipper of finished products all over the United States, this improvement is obvious to me.

Miscellaneous Commodities

Among the manufacturers of miscellaneous products such as beverages, chewing gum and cigars, the benefits of better railway service have been commensurate with other industries. Letter replies from them include the following:

P. D. Saylor, *president*, *Canada Dry Ginger Ale, Inc.*, New York.—Greatly improved railway transportation in the past few years has meant considerable to us. Bottles are bulky, easily broken, and, therefore, extra handling means loss and waste. We have such confidence in our rail transportation service that we carry only a few days supply of bottles in our plant, then we have routed to us so many carloads every day; the bottles being taken right from the cars to the machines, thus saving handling and breakage. The same thing applies to finished goods; owing to improved deliveries we are able to carry on with much lower finished product inventory.

David Dunn, *traffic manager*, *Wm. Wrigley, Jr. Company* (*chewing gum*), Chicago.—The improvement in railroad service in the past few years has been of great benefit to the chewing gum industry and has encouraged the keeping of smaller stocks and a quicker turnover. This condition means more revenue to the carriers. For example, our unit of sale is 100 boxes, approximately equal to 100 lb. We ship a great quantity of 40- 50- and 60-lb. orders which means additional freight charges to this company on account of the minimum charge rule of the carriers, where a shipper must pay for 100 lb. at the class of the commodity shipped, regardless of whether the shipment weighs 100 lb. or 10 lb. This condition we feel is caused somewhat by the improved service of the carriers as these 40- 50- and 60-lb. customers feel that they can get a shipment rolling and be assured of regularity of service in receiving it. Whereas in the past when the service of the railroads was not so good, a receiver of freight would order larger quantities, as he was not so certain of receiving shipments before he was out of the goods desired.

However, the dependability of the transportation service is a wonderful thing and means much to our factory in the receiving of raw material, thus enabling them to reduce their stocks to a reasonable amount and feel assured that same can be replaced without any great delay.

Robert W. Woodruff, *president*, *Coca-Cola Company* (*soft drinks*), Atlanta, Ga.—We have noted with satisfaction the remarkable improvement in efficiency and earnings of the present transportation machine and believe that it has been brought about by efficient management and the unusual co-operation which the carriers have been able to obtain from shippers. We believe

that both shippers and carriers will profit in the future to the degree which each contributes to the interest of the other.

Julius Lichenstein, president, Consolidated Cigar Corporation, New York.—We have found the railways have so improved their service since 1922, that notwithstanding our greatly increased sale of cigars, with peak production, we have been able to maintain normal inventories in order to meet the requirements of our jobbers. We have also found that through the greater dispatch and uniformity of the present railway service, our shipments reach the more distant points, such as the Pacific Coast, in the same time formerly required to reach the Central West from our Eastern shipping points, which obviously, enables our jobbers to carry a smaller inventory, fresher goods, with the resultant saving to both customer and ourselves.

A. R. A. Safety Section Analyzes Casualty Records

THE Safety Section of the American Railway Association, acting through the Committee on Statistics, T. H. Carrow, chairman, has sent to the member roads circular No. 254, in which the totals of employees (on duty) killed and injured on 116 Class I railroads in the first half of 1929, are set forth in a table in which the different roads are entered according to their standing on the basis of the number of individuals

CASUALTIES PER MILLION MAN HOURS, 116 CLASS I ROADS,
FIRST HALF, 1929

| | Killed | Injured | K. & I. |
|-------------------------------------|--------|---------|---------|
| All Classes of Employees | 0.29 | 13.90 | 14.19 |
| Maintenance of Way and Structures.. | 0.41 | 16.15 | 16.56 |
| Maintenance of Equipment and Stores | 0.13 | 12.28 | 12.41 |
| Train and Engine Service..... | 0.74 | 25.27 | 26.01 |

The circular calls attention to the fact that in the seven-year campaign, begun in 1923, in which the goal was a 35 per cent reduction in employee casualties in seven years, the reduction, to date, in the non-fatal injury rate has been *greater* than necessary to reach the goal, whereas in the fatal injury rate the goal figure *has* not been reached. The goal (35 per cent reduction in seven years) cannot be reached in the fatal injury class unless there can be an addition of 11 per cent; and, says the circular, some railroads must make a greater improvement in 1930 than heretofore; and, particularly, certain departments of many roads. Note is made also of the fact that some railroads have better non-fatal injury rates than the average while at the same time in the fatal class the record of the same road is not so good as the average.

The average of casualties for all Class I roads, for the first half of 1929, is 14.19. This is made up of 0.29 killed and 13.90 injured. The summary of results, comparing this 1929 report with the last year before the beginning of the campaign (1923) shows the following:

| | Year 1923 | Half of 1929 | Reduction |
|--------------------------|-----------|--------------|------------------|
| Employees Killed | 1866 | 603 | |
| —per million man-hours.. | 0.38 | 0.29 | 0.09 (24 p. c.) |
| Employees Injured | 148,146 | 28,706 | |
| —per million man-hours.. | 30.50 | 13.90 | 16.60 (54 p. c.) |

The committee calls upon every road to compare itself with other roads, to compare different divisions, one with another, and to compare different departments, one with another, thus stimulating more intensive study all around, with a view to disclosing the actual reasons for

Casualties in Train Accidents, Train-service Accidents and Non-train Accidents, January-June, 1929

| Rank | Road | Killed | Injured | Man-hours, Thousands | Casualties Per Million Man-hours Killed | Injured | Total |
|------|--|--------|---------|-------------------------|--|---------|-------|
| 7 | Union Pacific System | 15 | 144 | 62,422 | 0.24 | 2.31 | 2.55 |
| 13 | Southern System | 18 | 582 | 75,307 | 0.24 | 7.73 | 7.97 |
| 17 | Pennsylvania | 80 | 2,062 | 221,713 | 0.36 | 9.30 | 9.66 |
| 19 | Southern Pacific | 24 | 1,072 | 107,769 | 0.22 | 9.95 | 10.17 |
| 23 | Atlantic Coast Line | 29 | 1,171 | 110,463 | 0.26 | 10.60 | 10.86 |
| 32 | Baltimore & Ohio System | 17 | 899 | 78,532 | 0.22 | 11.45 | 11.67 |
| 33 | New York Central Lines | 73 | 2,451 | 203,678 | 0.36 | 12.03 | 12.39 |
| 36 | Chicago & North Western System | 18 | 857 | 66,586 | 0.27 | 12.87 | 13.14 |
| 37 | Illinois Central System | 27 | 1,018 | 78,967 | 0.34 | 12.89 | 13.23 |
| 38 | Atchison, Topeka & Santa Fe System | 18 | 1,121 | 81,729 | 0.22 | 13.72 | 13.94 |
| 40 | Chicago, Milwaukee, St. Paul & Pacific | 15 | 810 | 57,676 | 0.26 | 14.04 | 14.30 |
| 53 | Chicago, Rock Island & Pacific System | 20 | 796 | 48,633 | 0.41 | 16.37 | 16.78 |
| 54 | Missouri Pacific System | 14 | 1,301 | 77,891 | 0.18 | 16.70 | 16.88 |
| 68 | Chicago, Burlington & Quincy System | 15 | 1,192 | 59,587 | 0.25 | 20.00 | 20.25 |
| 82 | New York, New Haven & Hartford System | 16 | 1,001 | 43,149 | 0.37 | 23.20 | 23.57 |
| 87 | Reading System | 20 | 1,450 | 57,419 | 0.35 | 25.25 | 25.60 |
| 95 | Erie System | 24 | 1,257 | 46,932 | 0.51 | 26.78 | 27.29 |

killed and injured per million man-hours worked. At the head of the list stands the Nevada Northern on which the number of man-hours worked was 329,000 and no person was killed or injured. At the bottom stands the Galveston Wharf, where 690,000 man-hours were worked and the number of persons injured was 41 (none killed). This last item makes an average of 59.42 casualties per million man-hours, whereas the smallest average, that on the Gulf, Mobile & Northern, which stands fourth in the table, was 2.02. The tenth road in the list reports 4.24; the twentieth reports 10.62; the thirtieth 11.19; and the average for all roads is 14.19; the sixtieth road reports 19.37; the 70th, 20.42; the 100th, 29.53; the 110th, 33.52.

The character of this table may be understood from the extracts given in our double-column table, which show the totals on each road that reported 15 or more employees killed in the half year.

A supplementary table shows for each road the casualties per million man-hours as reported by the different departments. The summary of this table shows:

the differences in the averages. "It should be entirely feasible to bring the casualty rate of each department down to or below the average of such departments for the country as a whole; or to show why the rates do not come down."

UNDER THE PLANS FORMULATED by the Great Western Railway (Great Britain) to aid the British government in its schemes for the relief of unemployment, work has been started on various improvements, as follows: Construction of a new classification yard at Banbury; enlargement of present classification yards at Rogerstone and Severn Tunnel Junction; modernization of locomotive shops at Swindon; construction of new locomotive shops and roundhouses at Wolverhampton, Landore and Pantyffynnon, and double-tracking between Scorrer and Redruth and Bugle and Goonbarrow. The complete plans, which involve a total expenditure of £5,000,000, also include improvements to stations at Paddington (London), Bristol, Cardiff and Taunton. An additional £1,000,000 will be spent on machinery, 123,000 steel ties and 50,000 tons of rail.

The Illinois Central in 1929

Record year if last quarter had held to traffic volume of earlier months—Vicksburg bridge open soon

IN the first eleven months of 1929 the Illinois Central had operating revenues of \$166,927,911, an increase of 1.5 per cent over the same period in 1928. Comparing the two periods, freight revenues increased 2 per cent and passenger revenues declined 4.3 per cent. Operating expenses totaled \$128,802,108 in the first eleven months of 1929, an increase on 1.9 per cent. Maintenance of way expenses increased 5 per cent, maintenance of equipment expenses were 1.6 per cent higher and transportation expenses rose 0.8 per cent. The maintenance of way ratio rose 3.9 per cent, the maintenance of equipment ratio remained stationary and the transportation ratio showed a slight decline. The operating ratio was 77.2, a slight increase over the first eleven months of 1928.

These and other comparisons of revenues and expenses of the Illinois Central System are shown in Table I. The results for the year apparently, due to the falling off in revenues in the last quarter of the year, will not be quite as satisfactory as had been anticipated a few months ago. As a matter of fact, net railway operating income at the end of the first ten months was still slightly in excess of that of the same period in 1928, while one month later this cumulative figure had fallen almost one million dollars behind the 1928 eleven-month total. This decrease was almost wholly attributable to the decline in traffic in November.

Net income of the Illinois Central System in 1928, which figure should be approximated in 1929, totaled \$13,250,497, which was sufficient to pay preferred dividends and other deductions, the 7 per cent dividends on the common stock and increase the profit and loss credit

balance by almost five million dollars. The Illinois Central's corporate surplus at the end of 1928 stood at \$91,431,686, equivalent to \$68 for each share of common stock outstanding.

Selected freight service operating statistics for the first nine months of 1929 as compared with the same period of 1928 are shown in Table II. These figures, of course, do not reflect the decline in traffic which occurred in the last quarter of the year. It will be noted that considerable increase in ton-miles was handled with a less-than-proportionate increase in train-miles and that net

Table I—Illinois Central System, Revenues and Expenses Eleven Months

| | 1929 | 1928 | + Increase or — Decrease % |
|--------------------------------|---------------|---------------|-------------------------------|
| Freight Revenue | \$132,587,413 | \$129,944,726 | + 2.0 |
| Passenger Revenue | 21,758,662 | 22,740,552 | — 4.3 |
| Total Revenue | 166,927,911 | 164,439,484 | + 1.5 |
| M. of W. Expenses | 22,123,706 | 21,068,540 | + 5.0 |
| M. of E. Expenses | 38,271,228 | 37,656,416 | + 1.6 |
| Transp. Expenses | 59,204,681 | 58,728,037 | + 0.8 |
| Total Operating Expenses | 128,802,108 | 126,402,666 | + 1.9 |
| Net Ry. Op. Income | 25,089,712 | 26,095,221 | — 3.8 |
| M. of W. Ratio % | 13.3 | 12.8 | + 3.9 |
| M. of E. Ratio % | 22.9 | 22.9 | — |
| Transp. Ratio % | 35.5 | 35.7 | — 0.5 |
| Operating Ratio % | 77.2 | 76.9 | + 0.4 |

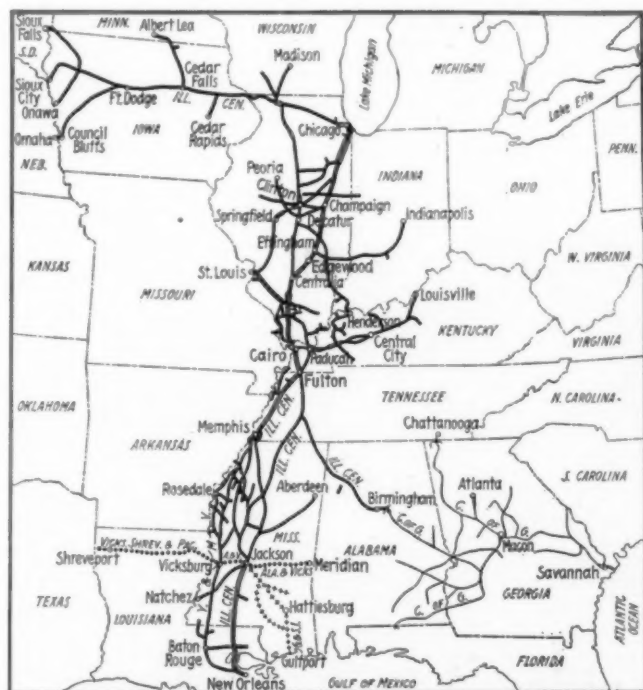
tons per car and car-miles per car-day rose. Better locomotive utilization is reflected in an increase of almost 11 per cent in locomotive-miles per locomotive-day. Equipment in unserviceable condition was greatly reduced—the ratio of unserviceable locomotives to total being brought down 3.7 per cent and of freight cars 15.8 per cent.

Nature of Freight Traffic

The system's tonnage of freight traffic in 1928 was divided among the various classifications of commodities as follows: Products of agriculture, 12.55 per cent; animal products, 2.10 per cent; products of mines, 48.26 per cent (bituminous coal, 35.69 per cent); forest products, 12.30 per cent; manufactures and miscellaneous, 21.78 per cent; and l.c.l., 3.01 per cent. The contribution in dollars of the various freight classifications and that of some of the more important individual commodities to gross revenues of the Illinois Central Railroad in 1928 were as follows:

| | |
|--------------------------------------|--------------|
| Products of Agriculture, Total | \$23,854,221 |
| Corn | 4,026,330 |
| Bananas | 5,405,066 |
| Animal Products, Total | 6,373,017 |
| Products of Mines, Total | 35,283,656 |
| Bit. Coal | 27,562,041 |
| Forest Products, Total | 15,287,758 |
| Lumber | 12,281,058 |
| Manufactures & Miscellaneous | 31,725,330 |
| Refined Oils & Gasoline | 5,124,734 |
| L. C. L. | 13,895,285 |

It will be readily noticed that the road's traffic is widely diversified—the great importance of two agricultural products, corn and bananas, being explained in the case of the former by the penetration of the corn belt by the company's Omaha line and in the latter by the high quality of service which is offered for this Central American product between the port of New Orleans and the great consuming center, Chicago. The revenues from cotton and sugar and their products are also note-



The Illinois Central

worthy. The revenue per ton-mile in 1928 was 0.914 cents and the average haul was 250 miles.

The Illinois Central Railroad in 1928 earned 13.9 of its gross revenues from its passenger service. This serv-

Table II—Illinois Central (inc. Y. & M. V.)—Comparison of Selected Freight Operating Statistics—Nine Months

| | 1929 | 1928 | Per cent of change Inc. Dec. |
|---------------------------------------|------------|------------|------------------------------|
| Mileage operated | 6,706 | 6,669 | 0.5 |
| Gross ton-miles (thousands) | 31,100,126 | 30,333,892 | 2.5 |
| Net ton-miles (thousands) | 12,974,856 | 12,609,351 | 2.9 |
| Freight train-miles (thousands) | 17,741 | 17,279 | 2.7 |
| Freight locomotive-miles (thousands) | 18,149 | 17,753 | 2.2 |
| Freight car-miles (thousands) | 772,389 | 756,767 | 2.1 |
| Freight train-hours | 1,275,334 | 1,265,398 | 0.8 |
| Car-miles per day | 45.6 | 43.1 | 5.8 |
| Net tons per loaded car | 26.8 | 26.8 | .. |
| Per cent loaded to total car miles | 62.7 | 62.2 | 0.8 |
| Net ton-miles per car day | 766 | 718 | 6.7 |
| Freight cars per train | 44.6 | 44.8 | 0.5 |
| Gross tons per train | 1,753 | 1,756 | 0.2 |
| Net tons per train | 731 | 1,756 | 0.2 |
| Train speed, miles per train hr. | 13.9 | 13.7 | 1.4 |
| Gross ton-miles per train-hour | 24,386 | 23,972 | 1.7 |
| Net ton-miles per train-hour | 10,174 | 9,965 | 2.1 |
| Lb. coal per 1,000 gross ton-miles | 130 | 129 | 0.8 |
| Locomotive miles per locomotive day | 78.4 | 74.6 | 5.1 |
| Per cent freight locos. unserviceable | 13.1 | 12.2 | 7.4 |
| Per cent freight cars unserviceable | 4.5 | 6.9 | 34.8 |

ice has ceased to be profitable, its operating ratio having been an even 100 in 1928 and the lower earnings of the service in 1929 will undoubtedly bring an increase in this

now in view is the new bridge across the Mississippi river at Vicksburg, Miss. While the Illinois Central and its subsidiaries will use this bridge as tenants only, it will nevertheless effect important savings in money and time as compared with car movements by ferry. Moreover, there will be less likelihood of a temporary suspension of traffic by reason of flood conditions. A steady increase in the movement of traffic through the Vicksburg gateway is, therefore, to be expected.

The Illinois Central in 1929 placed 15 new eight-wheel switching locomotives in service, distributed among eight terminals. These locomotives, with a tractive force of 51,041 lb., are being used to expedite the switching of long freight trains. The company in 1929 also purchased 1,000 automobile cars, 1,500 hopper cars, 200 flat cars, 25 cabooses and 34 passenger train cars. The company began in Iowa last year its first operation of highway motor coaches as substitution for train service.

The possibilities of the utilization of "air rights" over the company's electrified terminal in Chicago have been suggested as a non-carrier development which might bring financial and traffic benefits.

The company has been pursuing an aggressive industrial development policy, calculated to improve the production and prosperity of its territory and incidentally to increase its traffic. Augmenting the activities of

Table III—Illinois Central System—Revenues, Expenses and Dividends 1920-1928

| | Miles Operated | Freight Revenues | Passenger Revenues | Total Operating Revenues | Operating Exp. | Net Railway Operating Income | Non-Operating Income | Net Income | Dividends Paid |
|----------|----------------|------------------|--------------------|--------------------------|----------------|------------------------------|----------------------|--------------|----------------|
| (1) 1920 | 4,799 | \$1,013,606.40 | \$266,301.48 | \$1,218,045.79 | \$1,218,743.27 | \$185,220.85 | \$72,198.81 | \$135,711.22 | \$76,507.20 |
| 1921 | 4,799 | 1,070,920.90 | 247,403.50 | 1,411,270.65 | 1,168,523.33 | 175,422.27 | 50,392.38 | 97,007.94 | 76,507.20 |
| 1922 | 4,784 | 1,198,490.20 | 242,642.50 | 1,548,603.87 | 1,191,292.69 | 251,211.27 | 41,044.64 | 160,896.75 | 80,998.42 |
| 1923 | 4,840 | 1,270,816.45 | 270,424.00 | 1,656,269.81 | 1,324,292.31 | 229,062.43 | 68,167.39 | 154,850.73 | 83,086.42 |
| (2) 1924 | 6,218 | 1,267,859.58 | 286,983.24 | 1,738,381.31 | 1,340,249.20 | 281,020.73 | 35,778.26 | 162,485.57 | 91,530.26 |
| 1925 | 6,243 | 1,316,136.51 | 277,772.05 | 1,781,696.25 | 1,353,825.26 | 299,269.43 | 36,238.13 | 175,517.42 | 97,742.92 |
| (3) 1926 | 6,435 | 1,390,544.56 | 279,259.91 | 1,866,324.89 | 1,431,198.61 | 301,945.50 | 45,406.06 | 171,503.98 | 105,477.10 |
| 1927 | 6,601 | 1,428,701.79 | 271,172.59 | 1,829,675.60 | 1,419,216.43 | 271,769.51 | 43,729.79 | 121,318.71 | 105,754.66 |
| 1928 | 6,698 | 1,416,886.88 | 250,327.12 | 1,796,054.52 | 1,374,797.86 | 289,171.99 | 35,160.34 | 132,504.79 | 106,010.19 |

(1) Illinois Central Railroad only 1920-23.

(2) Includes Y. & M. V. 1924 and thereafter.

(3) Includes A. & V. and V. S. & P. 1926 and thereafter.

ratio. The decline in passenger revenues in 1929, however, was not as marked as in the preceding year. Then, too, the high-grade electrified suburban service offered by the road in Chicago territory attracts a constantly increasing patronage which tends to offset losses suffered elsewhere.

Maintenance of way expenditures of the Illinois Central Railroad in the years 1925-28 respectively averaged \$3,081, \$3,139, \$2,704 and \$2,450 per equated track-mile. The increase in the total of these expenses in 1929 indicates that a rise will be shown in such expenditures per equated track-mile. Rail replacements of average 95-lb. section in 1928 totaled 717 track-miles. Cross-tie replacements per equated track-mile in 1928 averaged 224, of which 210 were treated ties. Both these figures were larger than in the preceding year. The cost of repairs per locomotive-mile was 24.4 cents, as compared with 26 cents in 1927.

Recent Physical Improvements

Among the important construction projects completed by the Illinois Central in recent years for the purpose of promoting efficiency and improving service have been the building of the great Markham yard south of the Chicago metropolitan zone, electrification of the Chicago suburban service, the construction of the Edgewood cut-off in southern Illinois and the provision of modern shop facilities at Paducah, Ky. What is probably the most important project for improving the company's service

its own industrial development department, a firm of industrial engineers has been retained to make a thorough-going survey of its entire territory, analyzing taxation, raw materials, markets, labor conditions, power resources and other factors bearing upon industrial location. The program is carried on in co-operation with industries and has as its direct aim the securing of greater industrial production along its lines.

* * *



On the Eastern Division of the St. Louis-San Francisco

Purchasing and Stores Methods On European Railroads*

Technical research behind the purchasing of German State railways—The world's largest railway system

By N. F. Harriman

THE German State railways, or Reichsbahn, was organized in 1924 in conjunction with the work of the Dawes Reparations Commission, to operate as a private enterprise all of the government-owned railways which comprise almost all the railway mileage in Germany. The company is by far the largest individual employer of labor in the world, having in its service, according to its last annual report, 728,494 officers and employees. It operates 33,640 miles of track, 1,000 miles of which are electrified. Its rolling stock consists of 24,015 steam locomotives, 361 electric locomotives, 2 locomotives with internal combustion motors, 671,566 freight cars, 62,617 passenger cars and 20,787 baggage cars. It has about 12,000 depots, 2,900 water stations, 120 electric power stations and 55 gas works.

The Reichsbahn is not surpassed by any railroad in the world in the application of science to railroading. The road maintains a locomotive testing laboratory, a car testing laboratory, a brake testing laboratory, a mechanical laboratory, seven chemical laboratories, ten coal testing and thermal research laboratories, an experimental foundry, a laboratory for the studying of welding, and a laboratory for the study of bearing and lubrication problems. In addition, three fully equipped psycho-technical laboratories are maintained to apply psychological tests in the selection of shop men, secretaries, trainmen, automobile and truck drivers, etc., for railway service.

The Reichsbahn was the first railway in the world to install radio-telephones and it is now giving much attention to the use of light aluminum alloys in car construction to minimize dead weight. All wood ties are treated with creosote in six plants. Included among the scientific developments is a new journal bearing lining alloy called "Bahnmetall," consisting of commercial grade lead hardened with calcium, lithium and sodium. The alloy, which has been applied to thousand of cars and locomotives with the most satisfactory results, has the following composition:

| | | | | |
|----------|---------------|---|-----------|----------------|
| Calcium | 0.73 per cent | — | Tolerance | — .08 per cent |
| Sodium | 0.58 per cent | — | " | + .08 per cent |
| Lithium | 0.04 per cent | — | " | ± .01 per cent |
| Aluminum | 0.20 per cent | | | |
| Lead | Remainder | | | |

*The concluding article of a series, begun in the issue of Dec. 28, 1929, and continued in the issue of Jan. 18, 1930.



The Cologne Station is One of the Busiest in Europe

Comprehensive service tests are also being made on various modern types and makes of ball and roller bearings for use on railway equipment, although it should be stated that such studies are not new in Germany, as ball bearings were first tried experimentally in 1903, and roller bearings in 1909, on the Prussian-Hessian State Railway.

Engineering construction details, rolling stock, shop layouts, operating rules, materials, etc., are standardized with characteristic German thoroughness.

The work of the German Standards Committee being followed as far as practicable. As one of the results of the work, the 200 types of locomotives in service on the various state railways before the formation of the Reichsbahn have been reduced to 20 standard designs for passenger, freight, and switching service, while corresponding parts are interchangeable in all types.

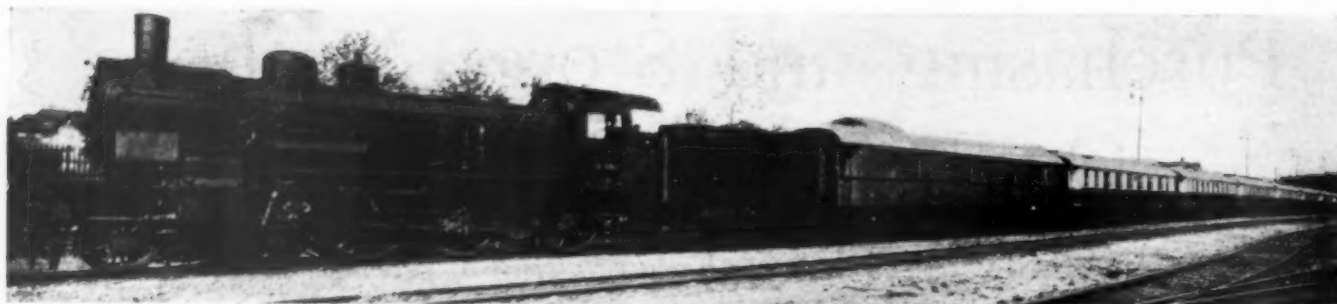
Purchasing, Engineering and Standards

Purchasing and stores, the design of new equipment, standards, specifications, tie-treating plants, the mechanical testing laboratory, inspection, etc., on the Reichsbahn are all managed by a central bureau. The chief of the bureau, Dr. Gustav Hammer, is an executive officer of the company and a prominent German engineer. This type of organization is considered in Germany to be very efficient, and it was originated by the Prussian Staatsbahn. The Union Pacific system is the only railroad system in the United States with a similar organization, the purchasing, engineering and standards on that system being co-ordinated under a vice-president.

The purchase division works closely with the finance division and the technical divisions, having charge of shops and the construction and maintenance of the lines. This division takes a great interest in standardization and in the application of standards to purchasing, and the technical purchase specifications are considered to be of the greatest importance. They are constantly being revised to keep them abreast of the needs of the service and the best commercial practice.

Centralize Large Purchases

The materials, supplies and equipment are purchased either centrally for the entire system, or by groups of



The Rheingold Express on the German State Railways

districts, or by a single district, office or station. It is realized that a too-highly centralized purchasing department, or one that works under inflexible rules, is insufficiently sensitive to operating conditions on a large system.

In general, large quantities are purchased centrally for the entire system, when such centralized purchasing would result in lower prices. When the annual expenditure involved exceeds \$12,500 for a given article, the purchase is usually made centrally. The following equipment and materials fall into this class: Locomotives, freight cars, baggage cars and their more important repair parts such as axles, wheels, tires, etc.; coal oil, waste, packing materials; maintenance of way materials such as rails, ties, switches, frogs, etc.; telegraph wire; shop materials such as screws, bolts and nuts, brake shoes, grate bars, plate-copper (a large item, as copper fire-boxes are used), bearing metal, paints, pig metals, glass, hose, etc.

Articles purchased by groups of districts include repair parts not purchased centrally; hydrogen and oxygen; wood fuel; soap, matches, etc.; lumber, fire-brick, leather products, roofing paints, all stationery supplies and testing equipment; while construction materials; ballast; electrical equipment, except telegraph wire; acetylene gas, carbide and some shop and office equipment are purchased by each district. The buying of rolling stock and of such commodities as coal, rail, ties, oils, standard parts, metals, textiles, etc., is assigned to specialists in those fields.

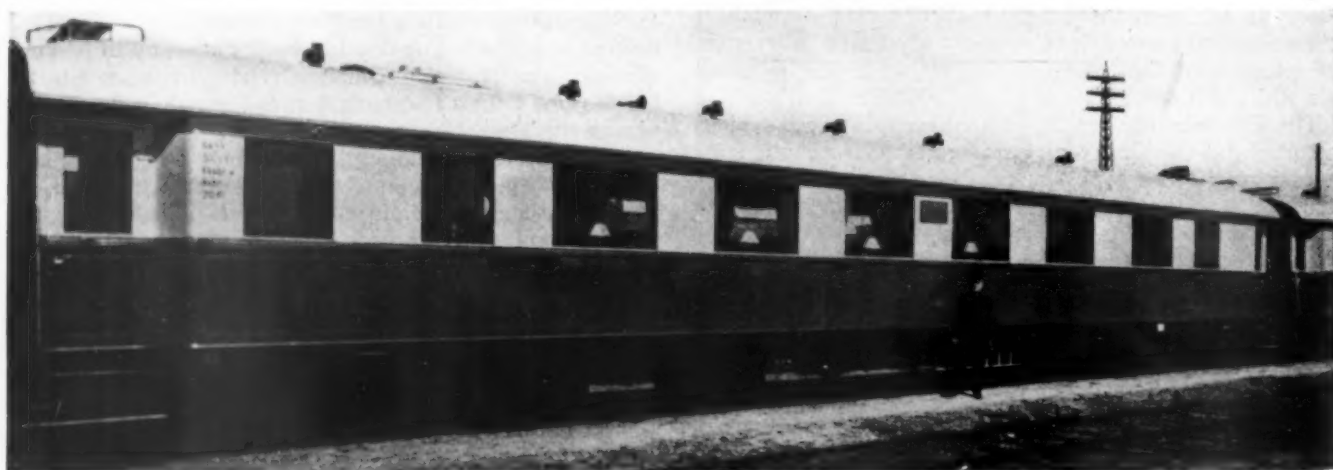
As far as possible, the purchases are limited to products of domestic manufacture, the supplies being obtained from foreign sources only when the domestic supply is insufficient; for example, petroleum, lubricating oils, wood ties, etc., and in such cases, the purchasing is done through German firms. The total purchases of the

system amount to about \$300,000,000 in the course of a single year.

Qualified Inspection

The inspection service is organized into 10 offices, with a large corps of inspectors who are required to have at least three years' experience in a shop, one year in a responsible mechanical position and at least three months in the mechanical testing laboratory to fit them for the testing work. The supply of shop materials, repair parts and tools is carried in 31 main stores and 420 substores. Studies are now in progress to concentrate these stores so that there will be only one main store in each district and to supply the local needs with a supply train which would make a monthly trip over each district. Maintenance of way materials are kept in 38 main stores and 2 substores, and studies are also in progress to reduce the number of these stores. Locomotives and car repair parts are stored in the repair shops, while special stores are maintained for obsolete and scrap materials and also for materials which require protection from heat, light or moisture, etc. Each of the stores is divided into the necessary substores and every effort is made to keep the stock at the lowest possible minimum. The stores have a very elaborate stock catalog, arranged by groups and individual subjects. Scrap materials, resulting from the repair of equipment, etc., are sorted and reclaimed when possible, and the residue sold, subject to market conditions.

The writer is indebted to Dr. Julius Dorpmüller, chief of the Committee of Executives, and to Dr. Gustav Hammer, president of the central bureau of the Reichsbahn, for data on the purchasing organization and methods of that company. He is also indebted to Felix Schwering, the mechanical engineer of the Cologne district, who accompanied the writer on his trip.



The Cars of the Rheingold are Steel with Violet and Ivory Colored Sides and a Silver Gray Roof. A "Kitchen" to Every Two Cars



Chicago, Burlington & Quincy Locomotive Equipped with the Martin Circulator

Tests of the Martin Circulator

Circulation equalizes water temperature and reduces fuel burned to fire up oil-burning locomotives

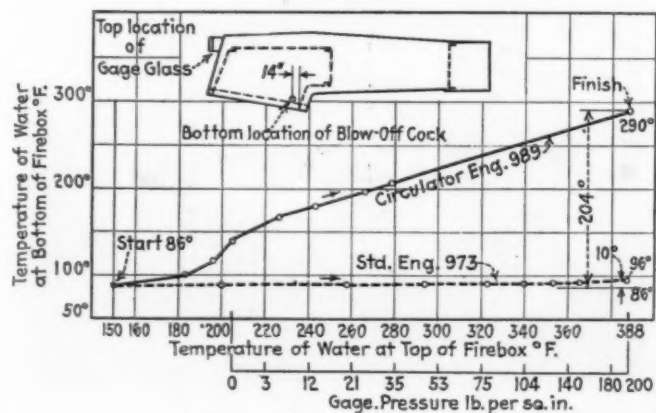
IN September, 1928, a Texas and Pacific 2-10-2 type locomotive, No. 541, burning oil, was put into service after being equipped with a Martin circulator* manufactured by the Locomotive Boiler Economizer Company, Los Angeles, Cal. Since that time it has gone from shopping to shopping and is now back in heavy pooled freight service. The locomotive was placed in the Marshall (Texas) shops for Class 3 repairs after making 76,477 miles during a period of 23 months over all divisions of the railroad so that its performance might be observed under widely varying conditions of service.

On removal of the tubes a careful interior examination of the boiler and firebox sheets was made and the surfaces of all the sheets were found to be in good condition, with no indication of corrosion or pitting. Normally a locomotive of the same size and class, under the

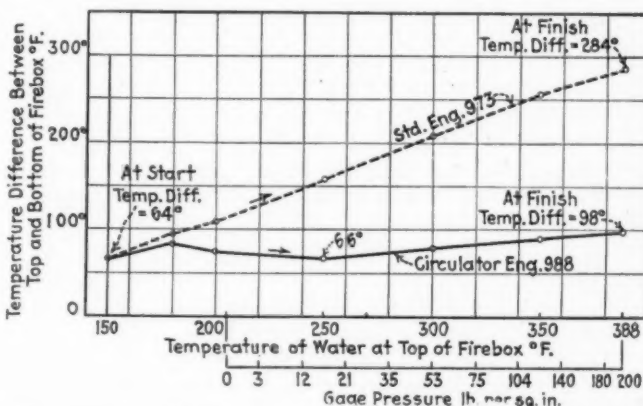
same operating conditions, requires a full tube renewal at the end of 50,000 miles.

After receiving Class 3 repairs the locomotive was again placed in regular service in September, 1929, and, as of January 1, 1930, has made a total of approximately

* For a description of the Martin circulator as installed on this locomotive see the *Railway Age* for June 9, 1928.



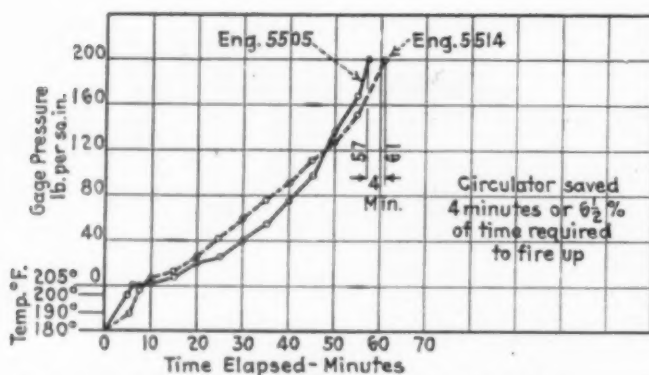
Water Temperatures at the Top and Bottom of the Firebox while Firing Up



Differences in Water Temperatures at the Top and Bottom of the Firebox while Firing Up

90,000 miles. The circulator as originally installed is at present in the locomotive in good condition, and records show that its cost of maintenance has been negligible, justifying fully its installation as a means of protecting the firebox sheets, tubes and shell at a minimum cost. The low cost of maintenance of the circulator is accounted for by the continuous and rapid circulatory movement of the water which it occasions, being the means of not only circulating water through itself, but effecting a decided stimulation of water movement through the water legs of the firebox and the dormant spaces of the boiler shell surrounding the tubes.

From the condition of the firebox and boiler disclosed by the interior examination of locomotive No. 541 and



A Comparison of the Time Required to Fire Up Locomotives with and without the Martin Circulator

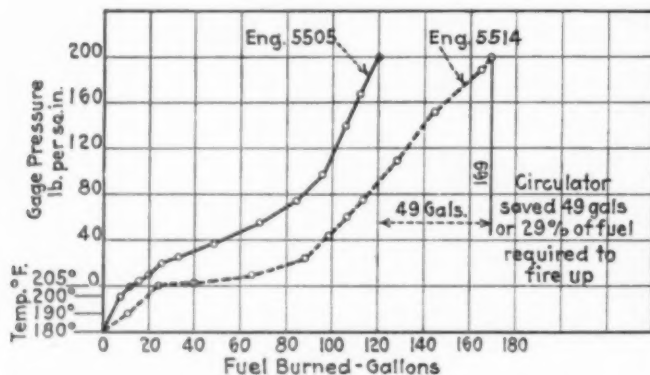
experience with other 2-10-2 locomotives of the Texas & Pacific subsequently equipped with the circulator, it is expected that the circulatory movement of the water effected will double the life of fireboxes and boiler tubes. While offering this protection to the firebox and boiler, the generation of the rapidly moving water into steam has consistently shown a fuel saving of approximately 10 per cent on locomotive No. 541 and all other locomotives equipped.

As now applied, the steel feed pipes supplying the circulator with water are secured in the throat sheet by beading over their ends against the inner side of the sheet and welding to the outer side of the sheet in a manner similar to the application of arch tubes. The feed pipes are entirely without the firing chamber and consequently are not subjected to the heat of combustion.

Effect of Water Movement

The effect of the water movement created by the circulator is illustrated graphically by the curves showing the results of a test made on the Southern Pacific, Texas and Louisiana Lines. Two locomotives of the same size and class and in like physical condition were fired up on adjoining pits. Thermometers recorded the water temperature at the gage glass and at the blow-off cock. No change in temperature of the water in the bottom of the leg of the standard locomotive was made until the boiler pressure reached 150 lb. per sq. in. and when the locomotive popped at 200 lb. there was a rise of only 10 deg. F. in water temperature from that at the beginning of the test. When the locomotive popped there was a difference in temperature of 284 deg. F. between the top and the bottom of the firebox.

In the locomotive equipped with the circulator the temperature of the water started to change quickly,



A Comparison of the Fuel Oil Burned in Firing Up Locomotives with and without the Martin Circulator

being 140 deg. F. at zero gage pressure and rising rapidly so that when the locomotive popped at 200 lb. pressure there was a temperature of 290 deg. F. in the bottom of the leg, or a difference in temperature between the top and the bottom of the firebox of only 98 deg. F.

Fuel Saving

Another graphic illustration shows the fuel saving effected by the circulator in firing up in enginehouses. These curves cover tests made on Chicago, Burlington & Quincy oil-burning locomotives at Casper, Wyo. The fuel saving is 49 gallons, or 29 per cent, in bringing the locomotive up to the popping point of 200 lb. pressure. Tests on other lines are said to show a consistent fuel saving for firing-up which can be generally taken as 25 per cent of the fuel required in the conventional type of oil-burning firebox.

Road tests have determined that circulator-equipped locomotives carry their water well even though objectionable priming conditions exist.

During the past two years it has been demonstrated that, by eliminating the fire brick of the conventional fire-pan arrangement from the side sheets and bottom of the firebox, locomotives can be turned in three hours less time at terminals. There is no brick against side sheets to cool down before water can be safely removed from the boiler for washing. Locomotives equipped with the circulator do not pop from excessive heat energy stored in the fire brick when the throttle is closed after a heavy pull. On booster-equipped locomotives having the circulator, the booster may be cut in for a longer period of time.

* * *



Myrdal, Norway—One of the Most Picturesque Stations on the Bergen-Oslo Line of the Norwegian State Railways

Communications and Books

The Wholesaler and Railway Buying

CHICAGO, ILL.

TO THE EDITOR:

As wholesalers of lumber, selling largely to the railway trade and allied industries, we have been much interested in the editorial, "The Jobber and Purchasing," in your issue of January 18.

From the text, we judge the term "Jobber" is used to mean wholesaler. There is a growing tendency not to use the word in this way because it is too often misinterpreted. Strictly speaking, a jobber is one who buys in job lots, often broken, damaged or discontinued lines of merchandise, and sells them as he can in connection with other stocks or separately. There is little of this in the railway supply business.

The true wholesaler buys and sells in wholesale quantities, always serves a wholesale type of trade, and handles the more or less regular line of goods naturally required by that trade. Such a wholesaler may either distribute the products of certain manufacturers over a considerable territory in connection with other items from other manufacturers, or may assemble from a number of manufacturers for a single piece of construction, quantities of certain items which are too large for any one manufacturer to produce economically or in the time required. In any case, the work is a problem of assembly and distribution governed by selling expense and the convenience of contacts as well as the available supply.

More wholesalers than the average buyer realizes, work from "demand to supply" rather than the other way. They ascertain or anticipate the requirements of their natural trade and have a supply of material ready or forthcoming to take care of it. Both wholesaler and jobber have their money in the goods they handle, and if they function honestly, they perform a service that justifies their cost of operating and a profit.

The broker or manufacturer's agent, in contrast with the wholesaler, sells for the account of someone else. If operating honestly, he also performs a legitimate but smaller service for a naturally smaller margin. Selling through a broker, the manufacturer or other owner of goods for sale has a greater personal responsibility and expense than if he sold outright to a wholesaler or jobber. This is, however, truly an expense,—not something which the ultimate buyer can expect to save or in any way eliminate.

The implied criticism, in your second paragraph, of organizations that parade as something different from what their actual operations justify is well merited. They are subject to the same sort of criticism as the wholesaler who attempts to parade as a manufacturer, or the manufacturer who tries to take credit for distributing goods of his own manufacture when he is actually wholesaling the products of others. These functions are all perfectly legitimate, and there is no reason why any of them should be hidden behind the cloak of something else. The trade belongs to the man who can sell it by service, whether he be manufacturer, wholesaler, jobber or broker. If he finances the transaction as a wholesaler does and buys the materials in addition to selling them, he has performed a larger number of the necessary factors in the operation than if he did only one of these, and is entitled to remuneration accordingly. No one who performs one or more of those functions honestly and efficiently need fear any criticism.

The "large scale buying," referred to in your third paragraph, might happen to originate in just the quantity that would suit a certain manufacturer at the time of the purchase, and the buyer might be in touch with just the right manufacturer, but in our experience, this does not often occur. Wholesalers are needed either to assemble or distribute or to do both, according to the quantities required. If the wholesaler is eliminated from the transaction, either the buyer or seller must perform these services, or they must be divided between

the two. Our observation leads us to believe that in most cases where this is done, the expense is greater than if the natural channel through a properly-organized wholesaler were followed. The distribution Conferences which are held under the auspices of the Chamber of Commerce of the United States and include bankers and other financial men as well as those interested in wholesale distribution have certainly brought out that distribution expense must be borne by someone or distributed among several, but must in any case be paid.

We can certainly applaud your closing paragraph. There is a lot of "bad jobbing," "bad purchasing," "bad wholesaling" and "bad brokering." The desirable thing is to strike at the abuses or the abusers and correct, minimize or eliminate them. We all know that striking an industry as a whole or at a group of industries will never correct a situation as it is bound to include more injustice than justice and little intelligence. For any buyer, however big, to decry all wholesaling and determine that he will buy only from the original producer is as foolish as for the household consumer to think he is going to the farm and factory for every item of food and clothing for every member of the family. It is not a question of quantity but a question of method. The present method began to come in when people stopped making their own shoes. Are we going back to the age when every one made his own and bought from no one else, or are we going on to use the modern facilities that we have helped to build up?

M. G. TRUMAN,

President, Marsh & Truman Lumber Co.

New Books

Transport Co-ordination by K. G. Fenelon, 142 pages, 8½ in. by 5½ in. Bound in cloth. Published by P. S. King & Son, Ltd., London. Price 6 shillings.

This book, subtitled "a study of present day transport problems," is an elaboration of a paper read by the author at the 1928 meeting of Section F. (Economic Science and Statistics) of the British Association for the Advancement of Science. It considers first the problems which have come to the fore with recent developments in highway motor transport and then proceeds from a subsequent analysis of all forms of carriage to assign to each its proper limits in what is conceived to be an economically sound plan for the utilization of transportation agencies as a whole.

Following an introductory chapter, which states the problem, the treatise considers the economic characteristics and respective economic spheres of the various forms of transport. While conceding that there are overlapping areas where, in each case, proper economic limits are not readily determinable, the author nevertheless finds it possible to draw lines of demarcation reasonably definite to prevent undue economic wastes.

Finally various types of co-ordination, notably rail and highway and rail and air, are given specific treatment, while a closing chapter reviews developments in passenger transport co-ordination in the larger cities of the world. Included also in the text are 28 statistical tables, presenting data used in the discussion.

"The 17," by Edwin C. Washburn. Illustrated. 290 pages, 8 in. by 5 in. Bound in cloth. Published by the author, Englewood, N. J.

Mr. Washburn, who is assistant to the president of the Baltimore & Ohio, and also the author of previous books entitled: "The Railroad Question;" "John Read, American," and "Caleb Cutter, New Englander," adopts in this new work a unique and fascinating method of presenting the early history of railroading in the central and northwestern States. The tale is unfolded through conversations of locomotives, for the author has endowed each of his locomotive characters with a distinct personality and powers of locution.

The principal character is "The 17" and as the novel opens we find this locomotive under construction in the Baldwin shops at Philadelphia discussing its future and wrangling with other embryo locomotives. Construction completed, the trip west is started, and along the way bits of railway history are gleaned from "The 17's" talks with other locomotives in junction-point yards. In this same manner the reader gathers the construction and early operating history of the middle western lines on which "The 17" saw service until it was finally sold and converted to become "No 1" of a northwestern road.

Outstanding features of the book are the chapter in description of the Hinckley fire and the rescue in connection therewith and the numerous well chosen photographs of historic railway equipment, facilities and scenes.

Perhaps a summary review as appropriate as any is that printed on the jacket in quotation from the Minneapolis Journal. This reads in part: "It is perhaps one of those rare volumes meant for adults which children will thoroughly enjoy, or one intended for children which will be equally appreciated by the adults."

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian,
Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

The Anti-Trust Laws of the United States. A group of discussions, the first one of which is "The Changing Economic Order," by Leon C. Marshall (p. 1-11). The discussions are assembled under the following headings, "Some Aspects of the Laws," Application to Specific Industries" (i.e. minerals, oil, coal and motion picture), "Some Observations" and "What of the Future?" The last includes, "The Need for a Commerce Court," by William J. Donovan (p. 138-145). Vol. 147, No. 236 of the Annals of the American Academy of Political and Social Science, dated January, 1930, 236 p. Pub. by the American Academy of Political and Social Science, Philadelphia, Penna. \$2.

Unification of Railroad Freight Terminals. A bibliography and brief statement of conditions in different cities "based on information available in the Seattle Public Library." 11 p. Issued by Municipal Reference Division, Seattle Public Library, Seattle, Washington. Apply.

Periodical Articles

Origin of Railroad Consolidation Idea. With some comment on reactions to Commission's plan. Bache Review, January 18, 1930, p. 1-2.

Rainfall Characteristics and Their Relation to Soils and Run-Off, by C. S. Jarvis. "The purpose of this paper is to present summarized information regarding precipitation and its occurrence in various countries and latitudes; its relation to soils and run-off; the vegetative, topographic, and physiographic features of the water-sheds; and the resultant influence on designs of drainage structures and channels." p. 3, "Since the beginning of these investigations and the assembling of the foregoing data, many opportunities have been presented for practical tests of methods herein advocated..." p. 23 "Conclusions..." 5. Many of the catastrophies resulting from storms and floods should be recognized as preventable accidents, and public works should be inaugurated to reduce such hazards." p. 31. Maps, charts, tables. Proceedings of the American Society of Civil Engineers, January, 1930, p. 3-47.

Should British Railways Be Nationalised? by H. T. G. Miller. A review of past considerations and a discussion of the present situation, methods of nationalisation, and "some probable effects of nationalisation." Journal of the Institute of Transport, January, 1930, p. 146-151.

Transportation from a Chemist's Point of View, by W. G. Prescott. "My remarks refer to work in the Argentine, and are based largely on my experience with the Buenos Aires & Pacific Railway. This railway possesses two laboratories, the main one which deals with all general work such as new waters, drinking supplies, general analyses, etc., and the other which is occupied entirely in the control of water softening plants." Journal of the Institute of Transport, January, 1930, p. 152-155.

Looking Backward

One Hundred Years Ago

The directors of the Charleston & Hamburg [now part of the Southern], which began the construction of a 60-in. gage railroad several miles west of Charleston, S. C., in 1829, decided in January, 1830, that steam should be the sole motive power to be used on that road. This constituted the first official recognition of the superiority of steam power for railways in this country.

Fifty Years Ago

The Central of Georgia has leased its lines, aggregating about 1,000 miles, together with its ocean steamship line between Savannah and New York, to the Nashville, Chattanooga & St. Louis, providing the Louisville & Nashville-Nashville & Chattanooga combination with a through route between St. Louis, Mo., and Savannah, Ga. It is planned to operate passenger trains on a 36-hr. schedule and freight trains on a four-day schedule between those two points.—*Railway Age*, January 22, 1880.

The Central Branch Union Pacific, extending from Atchison, Kan., to Waterville, 100 miles, has been turned over to the Missouri Pacific for operation [now a part of that road], while the control of the road still remains with the Union Pacific. The railroad, which was organized in 1859, was provided for as one of the branches in the acts incorporating the Union Pacific, and originally received from the government 187,608 acres of land, and bonds at the rate of \$16,000 per mile for the 100 miles.—*Railroad Gazette*, January 23, 1880.

The most important railway news of the week is that of the move by which the Louisville & Nashville has checkmated the Nashville, Chattanooga & St. Louis by secretly purchasing a majority of the latter company's stock. This absorption gives the Louisville & Nashville a railroad which has an aggregate mileage of about 3,500. While the two roads have been for a long time links in a connecting line, with a common interest in through traffic, recent acquisitions of short lines by each have brought them more and more into competition with each other.—*Railway Age*, January 22, 1880.

Twenty-Five Years Ago

M. J. Gormley has been appointed trainmaster of the Minnesota division of the Chicago & North Western, with headquarters at Tracy, Minn.—*Railway Age*, January 27, 1905.

A study of the personnel of the 30 state railroad commissions shows that of the 82 members, 29 are lawyers by profession, although they represent only 20 of the commissions. There are 19 farmers, planters or stock growers, 10 merchants and manufacturers, 5 former railway employees, 4 former railway officials, 3 civil engineers who have had railway connections and one or two each who at some time have had experience as newspaper editors, printers, physicians and railroad contractors. At least 58 held political office before they reached their present position.—*Railway Age*, January 27, 1905.

Ten Years Ago

Hale Holden, regional director of the Central Western region of the Railroad Administration, and former president of the Chicago, Burlington & Quincy, has been elected president of that road and the Colorado & Southern, effective with the termination of federal control.—*Railway Age*, January, 23, 1920.

The conferees who have been at work since December 22 trying to evolve satisfactory railroad legislation out of the conflicting provisions of the Esch and Cummins bills, during the first part of the week were still as far apart as ever on the controversial features of the Cummins bill which are not in the Esch bill, including the rule of rate making and the limitation of earnings, the plan of compulsory consolidation into 20 to 35 systems, the transportation board and federal incorporation.—*Railway Age*, January 23, 1920.

Odds and Ends of Railroading

No Need For Such Equipment

It is facetiously reported that an eastern director of a western railroad recently raised a squawk over the purchase of 100 stock cars. "What's the use," he asked, "of buying stock cars when stocks are at their present low level?"

Horse Sirloin

The Montana state board of railway commissioners, during the course of a rate hearing, discovered some interesting facts on horse meat. In a period of three months recently there were 166 carloads of range horses shipped from various points on the Great Northern to Butte for slaughter. It also develops that a horsemeat packing plant has been established at Butte.

All in the Day's Work

The freight yard of the Pennsylvania at Enola, Pa., near Harrisburg, on the evening of October 2, sent eastward, between 5:15 and 11 o'clock, 19 trains, equal to one every 18 minutes; and during all this time rain was falling in torrents. This performance, says the Pennsylvania News, in reporting it, is not the greatest achievement of its kind ever reported, but it is looked upon by observers as remarkable. The rainfall in 24 hours was 3½ inches.

An Empire Builder Passes

John Kingham, 83 years of age, who brought west around Cape Horn on a sailing vessel in 1864, the locomotive that later made the first transcontinental trip on the Central Pacific, died in San Jose, Cal., recently. During the railroad's construction the locomotive was used to carry Leland Stanford's private car over the line. It now is in the museum on the Stanford University campus, where it was assembled by Kingham. It is named the Governor Stanford.

A Fish Out of Water

Transporting a tugboat nearly 40 feet long a distance of 1,184 miles is the latest and one of the most difficult jobs performed by Pennsylvania employees. The tugboat Dragon was lifted from the water at Cape Charles, Va., by the Norfolk division's 100-ton derrick, put on a car and moved to Peoria, Ill., for placing in the Illinois river at that point. The boat weighed 30 tons and much preparatory work was necessary to figure out a route over which it could be transported so that it would clear all overhead bridges. After the loading process at Cape Charles, it was moved to the shops where the tug was properly secured and aligned for clearances on its long journey to Peoria.

Youngest Great-Grandfather

ROCHESTER, N. Y.

TO THE EDITOR:

William N. Muir, 64 years young, a railroader for 39 years, claims to be the youngest great-grandfather in railway service. Mr. Muir is freighthouse foreman for the Buffalo, Rochester & Pittsburgh, at Du Bois, Pa. His son, Robert, his grandson, William N., II, and his great-grandson, William N., III, all live at Du Bois. Aside from raising generous Scotch families, Bill Muir is a poet of no mean ability and his Scotch dialect songs are always in demand.

H. H. KINGSTON, JR.,
Manager, News Bureau,
Buffalo, Rochester & Pittsburgh.

Reversing Directions

Most railway men are surprised to know that, in one place at least in this country, trains going from the same place to the same destination on different railways, run for several miles, within a few hundred yards of each other, and in exactly opposite directions. This occurs on the Northern Pacific

and the Chicago, Milwaukee, St. Paul & Pacific, in Montana, on trains between St. Paul and Seattle. Westbound C. M. & St. P. & P. trains out of Lombard, run almost due south along the west bank of a creek, while westbound trains on the N. P. run almost due north on the other side of the creek. This condition exists for a distance of approximately 30 miles, and is believed to be the only case in the country.

Bees in the Bonnet

Something besides water came from the water spout in the Atlantic Coast Line yards at Montgomery, Ala., recently. And much to their sorrow, several employees can prove it. J. L. Singletary, yard clerk, and several companions, were attracted to the spout by a buzzing noise. They found that a colony of honey bees had selected it for a home. Of course, the bees could have been washed from the spout. But the men wanted them. Suggestion after suggestion was made for their capture. Attempting to execute the suggestions, however, almost resulted in a near-riot. After many casualties, Master Mechanic R. H. Duncan brought two negro boys to the rescue. The boys placed a bag over the end of the spout. A few minutes later the bees were captured. A number of badly battered railroad men painfully resumed their work, fully resolved that next time the bees want the spout, there won't be any argument.

The First Railway in America?

Although the honor of building the first railway in America has usually been accorded by common consent to Quincy, Mass., where a short tramway was constructed about 1825 for the purpose of moving granite blocks for use in the Bunker Hill monument from the Quincy quarries to the wharves, a rival claim has been set up by a story which appeared recently in the Savannah (Ga.) Morning News. The article, the work of Mrs. Dolores Colquitt, states that the first railway in this country was built in January, 1820, at The Hermitage, near Savannah, by Henry McAlpin, an emigrant from Scotland. The railway was first used to remove a house standing on the plantation, and later to transport bricks which were manufactured there. Mrs. Colquitt's story describes the use of iron rails in the construction and the operation of the railway for 27 years after it was built. The length of the road, which was built by slave labor, was several hundred yards. Horses furnished the motive power for this railroad as in the case of the Quincy road. McAlpin got his idea, the story recounts, from the use of railroads in the mines of England and Scotland, where both wooden and iron rails were used.

A Moving Art

("Deft Shunting of Freight Cars Is Modern Art"—Headline)

Art is long and time is fleeting
And art's problems are defeating
Multitudes of earnest souls who work in paint and clay.
Therefore, if you're vainly itching
For expression, why not switching
Box cars in the freightyards? It brings finesse in play.
Cutting out a tank car coolly,
Shooting coal gondolas—truly
That is art of purest sheen; no value does it lack.
Halting box cars close to gangways,
Beating brakies at their slang ways—
Boy, if you can make the grade you're on the proper track.
Far too long the craft's felt stunted.
Railroad braking has been shunted
To a very minor role. At last the sleeper wakes;
Now its stand's been quadrupled.
With true art it has been coupled,
Youth may seek the Haul of Fame since braking's got
the breaks!

GENE MORGAN, Chicago Daily News.

NEWS of the WEEK



THE CAR FOREMEN'S ASSOCIATION OF CHICAGO will hold its next meeting at the Great Northern Hotel on February 10. The discussion will be on the Interchange Rules.

PAT M. NEFF, former governor of Texas, who was recently appointed as a member of the Texas Railroad Commission, has been elected chairman of the commission.

THE RAILWAY EXPRESS AGENCY has leased the fifth floor of the New York Central Building, 230 Park avenue, New York City, to which its general offices will be moved from 65 Broadway.

THE CLEVELAND (OHIO) RAILWAY CLUB will hold its next meeting on Monday evening, February 3, at the Hotel Hollenden. The discussion will be on the new A. R. A. Mechanical Rules for 1930.

THE NEW ENGLAND RAILROAD CLUB will hold its next meeting at 6:30 p.m. on February 11, at Copley-Plaza Hotel, Boston. The speaker will be J. W. Smith, vice-president and general manager of the Boston & Maine.

THE HOUSE COMMITTEE ON RULES on January 17 reported to the House a resolution authorizing the proposed investigation by the committee on interstate and foreign commerce of the relations between railroads and holding companies, investment trusts, etc.

THE CINCINNATI (OHIO) RAILWAY CLUB will hold its next meeting at the Chamber of Commerce, Cincinnati, on February 18. This will be a dinner party, beginning at six o'clock, and there will be musical entertainment. The chief speaker will be E. J. Hoff, vice-president of the Central Trust Company, Cincinnati.

THE CALIFORNIA RAILROAD COMMISSION has extended until January 1, 1931, the time limit within which all railroads within the state must comply with its general order requiring that all interlocking plants at intersections of one railroad with another be brought into conformity with the commission's standards of construction.

Forty-six interlocking plants in the state, which were constructed prior to the commission's order, have not been modernized.

D. & I. R. Operated by D. M. & N.

The operation of the Duluth & Iron Range has been turned over to the Duluth, Missabe & Northern under a lease which became effective on January 10. The lease includes all physical operating properties of the Iron Range but does not include certain lands.

Seven Hundred Life Passes

The Missouri Pacific has presented long service passes to 700 former employees who have completed more than 40 years of service. The passes are good during the lifetime of the bearer and are good over all Missouri Pacific lines.

California Grade Crossings

The transportation division of the California Railroad Commission, following a study of highway grade crossings with railroads in that state, has issued a report in which it recommends continued restriction in the construction of new crossings and the closing of all existing crossings which can reasonably be closed. It also recommends the making of a comprehensive plan for grade separations at the more important crossings, including a method for financing the cost; and protection by means of adequate and uniform signals, at existing grade crossings.

The John Fritz Medal

Dr. Ralph Modjeski, Mem. Am. Soc. C. E. and eminent bridge engineer, is the recipient this year of the John Fritz Gold Medal. The medal was presented at the annual banquet of the American Society of Civil Engineers at the Hotel Commodore, New York City, on January 15, at which were present about 600 members and guests. The presentation was by Dexter S. Kimball, past president of the American Society of Mechanical Engineers, who is chairman of the board

which made the award. The presentation, said Dr. Kimball, was for "notable achievement as an engineer of great bridges, combining the principles of strength and duty."

Grade Crossing Protection in New York State

The cost of installing automatic signals at grade crossings to give notice when a train is approaching, ought to be shared equally between the state and the railroad. At a hearing before the New York State Public Service Commission in Albany on January 22, the representatives of the New York State Automobile Association and those of the railroads agreed, according to the reports, that this rule ought to prevail. A bill intended to carry out this principle was introduced in the legislature last year but was not adopted. It is expected that a similar bill will be introduced in the present legislature.

Illinois Central Co-ordinates Standardization Work

The Illinois Central has recognized and co-ordinated its supervision of standards of materials and practices employed in construction and maintenance work, with the vice-president in charge of purchases and stores as chairman of the two committees under whose jurisdiction that work has been placed. Besides the vice-president, the committee on mechanical standards is made up of the general superintendent of motive power, the superintendent of the car department and the engineer of tests. The committee on roadway standards, in addition to the vice-president, consists of the chief engineer, the engineer maintenance of way and the engineer of tests. All materials purchased or used in construction and maintenance work are required to meet the standards established by the two committees.

Chesapeake & Ohio Lines to Spend Over \$100,000,000

Directors of the Chesapeake & Ohio, the Hocking Valley and the Pere Marquette have approved budgets totaling \$42,000,000 for additions and betterments. This is in addition to \$40,000,000 pre-

viously authorized for the purchase of locomotives and other rolling stock in 1930. Approval of other budgets pending will bring the total for the year to more than \$100,000,000.

All the contemplated projects will increase the capacity and reduce the operating expenses of the C. & O. lines. Some of the projects will not be completed this year and will require further expenditures next year. They are designed

to make the C. & O. the nucleus of a new trunk line from East to West having an important system extending into Northern Michigan. In line with this policy, the Pere Marquette will be built up to carry heavy traffic over its Lake Michigan ferries.

The C. & O. proper is being re-equipped with more powerful motive power. Tunnels will be enlarged, new tracks laid, passing tracks lengthened, shops expanded

and bridges rebuilt and strengthened. At Newport News the C. & O. will spend more than \$1,500,000 on a low level coal pier that will double its coal delivery capacity there. It will also expend \$1,500,000 on a merchandise pier at Hampton Roads. It will spend \$750,000 on a freight house at Cincinnati, and it will build a new freight terminal at Columbus, Ohio, and a new passenger station at
(Continued on page 264)

Operating Revenues and Operating Expenses of Class I Steam Railways in the United States

FOR THE MONTH OF NOVEMBER, 1929 AND 1928

| Item | United States | | Eastern District | | Southern District | | Western District | |
|---|-------------------------|-------------------------|------------------|---------------|-------------------|--------------|------------------|---------------|
| | 1929 | 1928 | 1929 | 1928 | 1929 | 1928 | 1929 | 1928 |
| Average number of miles operated | 241,854.32 | 241,536.79 | 60,157.58 | 60,082.90 | 45,764.84 | 45,728.69 | 135,931.90 | 135,725.20 |
| Revenues: | | | | | | | | |
| Freight | \$384,040,373 | \$415,927,651 | \$163,237,299 | \$179,634,037 | \$68,125,307 | \$73,408,633 | \$152,677,767 | \$162,884,981 |
| Passenger | ^a 62,450,632 | ^b 65,283,401 | 34,078,846 | 35,096,900 | 8,193,387 | 8,900,595 | 20,178,399 | 21,285,906 |
| Mail | ^c 12,669,153 | 9,495,942 | 6,212,392 | 3,741,693 | 1,744,486 | 1,626,802 | 4,712,275 | 4,127,447 |
| Express | 12,488,432 | 12,984,907 | 5,364,044 | 5,653,287 | 1,834,122 | 1,961,462 | 5,290,266 | 5,370,158 |
| All other transportat'n | 16,036,441 | 17,065,608 | 9,316,752 | 9,899,905 | 1,243,778 | 1,208,679 | 5,475,911 | 5,957,024 |
| Incidental | 10,615,385 | 10,522,640 | 5,528,827 | 5,704,158 | 1,318,738 | 1,219,751 | 3,767,820 | 3,598,731 |
| Joint facility—Cr. | 1,228,821 | 1,115,192 | 373,703 | 397,136 | 198,944 | 165,348 | 656,174 | 552,708 |
| Joint facility—Dr. | 318,375 | 310,077 | 84,913 | 80,098 | 35,971 | 37,557 | 197,491 | 192,422 |
| Railway operating revenues | 499,210,862 | 532,085,264 | 224,026,950 | 240,047,018 | 82,622,791 | 88,453,713 | 192,561,121 | 203,584,533 |
| Expenses: | | | | | | | | |
| Maintenance of way and structures | 67,839,061 | 68,792,874 | 29,303,221 | 29,190,740 | 11,828,705 | 11,833,356 | 26,707,135 | 27,768,778 |
| Maintenance of equipment | 99,441,878 | 98,751,396 | 47,552,855 | 46,525,355 | 17,771,111 | 17,576,835 | 34,117,912 | 34,649,206 |
| Traffic | 10,820,842 | 10,355,584 | 4,301,206 | 3,875,396 | 1,986,786 | 2,029,276 | 4,532,850 | 4,450,912 |
| Transportation | 174,435,817 | 177,784,175 | 83,184,144 | 84,409,272 | 26,547,760 | 27,601,889 | 64,703,913 | 65,773,014 |
| Miscellaneous operat'ns | 4,510,419 | 4,360,476 | 2,156,044 | 2,150,182 | 469,917 | 476,494 | 1,884,458 | 1,733,800 |
| General | 16,559,913 | 16,047,249 | 7,248,375 | 7,149,336 | 2,716,489 | 2,667,567 | 6,595,049 | 6,230,346 |
| Transportation for investment—Cr. | 1,440,782 | 1,250,933 | 424,631 | 289,100 | 143,611 | 60,291 | 872,540 | 901,542 |
| Railway operating expenses | 372,167,148 | 374,840,821 | 173,321,214 | 173,011,181 | 61,177,157 | 62,125,126 | 137,668,777 | 139,704,514 |
| Net revenue from railway operations | 127,043,714 | 157,244,443 | 50,705,736 | 67,035,837 | 21,445,634 | 26,328,587 | 54,892,344 | 63,880,019 |
| Railway tax accruals | 30,000,219 | 34,220,974 | 12,227,472 | 14,361,117 | 5,386,368 | 6,331,856 | 12,386,379 | 13,528,001 |
| Uncollectible ry. revs. | 108,321 | 132,923 | 54,628 | 89,060 | 18,975 | 13,410 | 34,718 | 30,453 |
| Railway operating income | 96,935,174 | 122,890,546 | 38,423,636 | 52,585,660 | 16,040,291 | 19,983,321 | 42,471,247 | 50,321,565 |
| Equipment rents—Dr. balance | 8,108,813 | 7,431,814 | 4,057,787 | 3,667,133 | 4,409,997 | 4,497,151 | 4,461,023 | 4,261,832 |
| Joint facility rent—Dr. balance | 2,156,894 | 1,903,001 | 1,052,564 | 801,239 | 223,812 | 124,942 | 880,518 | 976,820 |
| Net railway operating income | 86,669,467 | 113,555,731 | 33,313,285 | 48,117,288 | 16,226,476 | 20,355,530 | 37,129,706 | 45,082,913 |
| Ratio of expenses to revenues (per cent) .. | 74.55 | 70.45 | 77.37 | 72.07 | 74.04 | 70.23 | 71.49 | 68.62 |

FOR ELEVEN MONTHS ENDED WITH NOVEMBER, 1929 AND 1928

| Item | United States | | Eastern District | | Southern District | | Western District | |
|---|--------------------------|--------------------------|------------------|-----------------|-------------------|---------------|------------------|-----------------|
| | 1929 | 1928 | 1929 | 1928 | 1929 | 1928 | 1929 | 1928 |
| Average number of miles operated | 241,752.45 | 241,276.17 | 60,129.37 | 60,104.14 | 45,764.25 | 45,712.90 | 135,858.83 | 135,459.13 |
| Revenues: | | | | | | | | |
| Freight | \$4,484,946,018 | \$4,330,562,330 | \$1,949,119,004 | \$1,859,198,411 | \$786,503,138 | \$765,886,855 | \$1,749,323,876 | \$1,705,477,064 |
| Passenger | ^a 799,143,548 | ^b 825,510,286 | 427,697,709 | 435,083,985 | 108,087,534 | 118,213,628 | 263,358,305 | 272,212,673 |
| Mail | ^c 135,682,451 | 92,367,995 | 55,381,231 | 35,638,611 | 20,894,214 | 15,877,545 | 59,407,006 | 40,851,839 |
| Express | 136,142,391 | 128,842,272 | 63,199,969 | 58,922,577 | 20,423,889 | 19,024,018 | 52,518,533 | 50,895,677 |
| All other transportat'n | 194,160,885 | 191,296,422 | 112,782,078 | 108,555,375 | 13,543,876 | 13,308,176 | 67,834,931 | 69,432,871 |
| Incidental | 124,395,085 | 116,132,789 | 62,970,055 | 58,394,149 | 14,875,838 | 14,930,855 | 46,549,192 | 42,807,785 |
| Joint facility—Cr. | 12,543,236 | 12,238,771 | 4,093,790 | 4,633,157 | 2,022,200 | 1,776,687 | 6,427,246 | 5,828,927 |
| Joint facility—Dr. | 3,558,532 | 3,821,242 | 900,640 | 1,190,684 | 389,875 | 399,597 | 2,268,017 | 2,230,961 |
| Railway operating revenues | 5,883,455,082 | 5,693,129,623 | 2,674,343,196 | 2,559,235,581 | 965,960,814 | 948,618,167 | 2,243,151,072 | 2,185,275,875 |
| Expenses: | | | | | | | | |
| Maintenance of way and structures | 802,629,961 | 786,738,207 | 337,064,346 | 327,000,655 | 138,677,661 | 135,547,169 | 326,887,954 | 324,190,383 |
| Maintenance of equipment | 1,113,060,322 | 1,080,218,632 | 530,670,161 | 504,724,233 | 194,637,233 | 191,496,201 | 387,752,928 | 383,998,198 |
| Traffic | 119,278,579 | 114,923,146 | 45,702,073 | 42,847,891 | 21,673,855 | 22,083,382 | 51,902,651 | 49,991,873 |
| Transportation | 1,936,210,934 | 1,926,697,319 | 918,009,651 | 902,775,952 | 301,333,033 | 307,205,557 | 716,868,250 | 716,715,810 |
| Miscellaneous operat'ns | 54,070,268 | 51,588,639 | 24,868,804 | 23,993,173 | 5,900,476 | 6,222,867 | 23,300,988 | 21,372,599 |
| General | 178,702,624 | 177,658,424 | 77,959,203 | 79,173,325 | 30,029,552 | 29,640,029 | 70,713,869 | 68,845,070 |
| Transportation for investment—Cr. | 12,820,432 | 14,125,669 | 3,183,656 | 2,603,624 | 1,062,549 | 1,114,229 | 8,574,227 | 10,407,816 |
| Railway operating expenses | 4,191,132,256 | 4,123,698,698 | 1,931,090,582 | 1,877,911,605 | 691,189,261 | 691,080,976 | 1,568,852,413 | 1,554,706,117 |
| Net revenue from railway operations | 1,692,322,826 | 1,569,430,925 | 743,252,614 | 681,323,976 | 274,771,553 | 257,537,191 | 674,298,659 | 630,569,758 |
| Railway tax accruals | 379,445,660 | 360,597,256 | 160,409,223 | 152,029,043 | 67,698,798 | 64,857,561 | 151,337,639 | 143,710,652 |
| Uncollectible ry. revs. | 1,062,974 | 1,195,157 | 441,386 | 596,847 | 237,792 | 206,661 | 383,796 | 391,649 |
| Railway operating income | 1,311,814,192 | 1,207,638,512 | 582,402,005 | 528,698,086 | 206,834,963 | 192,472,969 | 522,577,224 | 486,467,457 |
| Equipment rents—Dr. balance | 87,277,376 | 85,328,209 | 44,509,936 | 43,670,548 | 4,302,832 | 4,243,540 | 46,070,272 | 44,091,201 |
| Joint facility rent—Dr. balance | 23,200,531 | 22,514,558 | 11,652,633 | 11,335,560 | 2,213,734 | 1,966,116 | 9,334,164 | 9,212,882 |
| Net railway operating income | 1,201,336,285 | 1,099,795,745 | 526,239,436 | 473,691,978 | 207,924,061 | 192,940,393 | 467,172,788 | 433,163,374 |
| Ratio of expenses to revenues (per cent) .. | 71.24 | 72.43 | 72.21 | 73.37 | 71.55 | 72.85 | 69.94 | 71.14 |

^a Includes \$2,831,307 sleeping and parlor car surcharge. ^b Includes \$2,801,617 sleeping and parlor car surcharge. ^c Includes approximately \$3,009,012 back railway mail pay. ^d Deficit or other reverse items. ^e Includes \$37,142,789 sleeping and parlor car surcharge. ^f Includes \$36,575,463 sleeping and parlor car surcharge. ^g Includes approximately \$33,590,184 back railway mail pay.

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.

Operating Statistics of Large Steam Railways—Selected Items for November, 1929, Comp

| Region, road and year | Average miles of road operated | Train-miles | Locomotive-miles | | Car-miles | | Ton-miles (thousands) | | Average number of locomotives on line | | | |
|---|--------------------------------|-------------|----------------------|---------|--------------------|-----------------|--|------------------------------|---------------------------------------|---------------|-----------------------|--------|
| | | | Principal and helper | Light | Loaded (thousands) | Per cent loaded | Gross. Excluding locomotives and tenders | Net. Revenue and non-revenue | Servicable | Un-servicable | Per cent unservicable | Stored |
| New England Region: | | | | | | | | | | | | |
| Boston & Albany.....1929 | 407 | 204,348 | 216,611 | 21,642 | 4,837 | 65.1 | 257,260 | 92,734 | 99 | 24 | 19.6 | 28 |
|1928 | 407 | 199,112 | 211,543 | 21,504 | 5,136 | 66.9 | 269,747 | 102,247 | 102 | 22 | 17.4 | 31 |
| Boston & Maine.....1929 | 2,059 | 403,089 | 472,248 | 57,231 | 13,136 | 66.2 | 708,831 | 266,983 | 243 | 54 | 18.2 | 29 |
|1928 | 2,074 | 434,395 | 519,262 | 63,181 | 13,647 | 68.6 | 722,295 | 287,640 | 281 | 39 | 12.2 | 46 |
| N. Y., New H. & Hart...1929 | 2,106 | 491,470 | 567,579 | 36,880 | 16,236 | 64.5 | 895,057 | 351,169 | 290 | 49 | 14.5 | 24 |
|1928 | 2,106 | 537,413 | 605,247 | 38,670 | 16,861 | 67.5 | 909,956 | 379,704 | 304 | 59 | 16.2 | 38 |
| Great Lakes Region: | | | | | | | | | | | | |
| Delaware & Hudson.....1929 | 875 | 328,269 | 440,995 | 51,073 | 10,317 | 60.5 | 655,180 | 305,069 | 240 | 32 | 11.9 | 81 |
|1928 | 875 | 354,176 | 475,109 | 47,665 | 11,309 | 63.3 | 716,550 | 348,135 | 232 | 40 | 14.7 | 62 |
| Del., Lack. & Western...1929 | 998 | 488,251 | 539,027 | 62,982 | 16,819 | 65.2 | 969,458 | 397,347 | 233 | 54 | 18.8 | 27 |
|1928 | 998 | 567,343 | 641,995 | 74,486 | 18,849 | 67.9 | 1,079,681 | 465,170 | 235 | 58 | 19.8 | 9 |
| Erie (inc. Chi. & Erie)....1929 | 2,316 | 912,329 | 968,421 | 68,024 | 37,521 | 58.7 | 2,353,825 | 912,833 | 409 | 98 | 19.3 | 59 |
|1928 | 2,317 | 970,149 | 1,051,700 | 90,828 | 41,192 | 61.7 | 2,550,061 | 1,045,595 | 410 | 115 | 21.9 | 11 |
| Lehigh Valley1929 | 1,343 | 511,086 | 558,662 | 62,896 | 15,867 | 61.7 | 962,231 | 395,264 | 278 | 73 | 20.9 | 33 |
|1928 | 1,343 | 616,516 | 681,545 | 75,889 | 19,210 | 62.4 | 1,177,775 | 508,570 | 323 | 86 | 21.0 | 19 |
| Michigan Central1929 | 1,822 | 500,441 | 501,632 | 14,836 | 15,985 | 57.9 | 985,808 | 342,357 | 193 | 43 | 18.2 | 40 |
|1928 | 1,822 | 562,842 | 569,386 | 17,316 | 19,082 | 61.2 | 1,089,038 | 397,568 | 197 | 49 | 19.9 | 30 |
| New York Central.....1929 | 6,467 | 2,157,461 | 2,359,174 | 198,794 | 75,936 | 58.0 | 4,874,059 | 2,008,999 | 993 | 300 | 23.2 | 164 |
|1928 | 6,459 | 2,110,210 | 2,387,998 | 168,338 | 80,287 | 59.7 | 5,008,016 | 2,109,826 | 970 | 379 | 28.1 | 147 |
| New York, Chi. & St. L...1929 | 1,665 | 651,917 | 658,197 | 6,606 | 19,640 | 59.4 | 1,159,237 | 418,901 | 206 | 46 | 18.2 | 20 |
|1928 | 1,665 | 628,763 | 634,937 | 6,217 | 21,014 | 63.4 | 1,183,029 | 448,924 | 223 | 63 | 22.0 | 51 |
| Pere Marquette1929 | 2,178 | 455,608 | 459,100 | 4,303 | 10,666 | 58.1 | 668,467 | 265,381 | 177 | 24 | 12.1 | 11 |
|1928 | 2,181 | 458,162 | 462,849 | 5,351 | 11,599 | 61.5 | 696,133 | 292,964 | 180 | 28 | 13.6 | 8 |
| Pitts. & Lake Erie.....1929 | 231 | 135,086 | 139,511 | 2,949 | 4,526 | 56.4 | 374,778 | 202,963 | 49 | 12 | 18.9 | 7 |
|1928 | 231 | 136,527 | 138,932 | 1,559 | 4,796 | 57.4 | 409,551 | 229,097 | 59 | 10 | 14.2 | 14 |
| Wabash1929 | 2,497 | 786,313 | 828,404 | 14,341 | 21,951 | 60.3 | 1,305,282 | 469,697 | 286 | 72 | 20.0 | 18 |
|1928 | 2,497 | 773,545 | 801,000 | 11,894 | 23,072 | 63.7 | 1,324,373 | 505,011 | 291 | 75 | 20.5 | 28 |
| Central Eastern Region: | | | | | | | | | | | | |
| Baltimore & Ohio.....1929 | 5,536 | 1,927,448 | 2,300,612 | 167,390 | 56,155 | 58.0 | 3,913,148 | 1,771,530 | 1,049 | 184 | 14.9 | 163 |
|1928 | 5,534 | 2,057,567 | 2,456,162 | 187,390 | 61,412 | 60.2 | 4,191,667 | 1,974,120 | 995 | 237 | 19.2 | 80 |
| Central of New Jersey....1929 | 691 | 265,535 | 286,596 | 47,332 | 7,549 | 56.4 | 520,225 | 237,451 | 160 | 41 | 20.4 | 9 |
|1928 | 691 | 277,464 | 298,874 | 45,772 | 8,060 | 57.7 | 555,076 | 261,819 | 184 | 25 | 12.0 | 19 |
| Chicago & Eastern Ill....1929 | 946 | 238,340 | 239,387 | 2,694 | 6,381 | 62.9 | 389,888 | 172,242 | 101 | 66 | 39.6 | 28 |
|1928 | 945 | 267,424 | 268,980 | 3,257 | 7,265 | 62.6 | 463,356 | 212,053 | 103 | 66 | 38.9 | 21 |
| Clev., Cin., Chi. & St. L...1929 | 2,371 | 752,137 | 784,199 | 18,680 | 22,340 | 58.4 | 1,492,494 | 642,112 | 301 | 122 | 28.8 | 8 |
|1928 | 2,370 | 740,129 | 768,608 | 18,365 | 23,356 | 60.2 | 1,534,313 | 703,358 | 323 | 113 | 25.9 | 18 |
| Elgin, Joliet & Eastern...1929 | 453 | 128,236 | 137,573 | 7,169 | 3,442 | 59.1 | 266,660 | 134,046 | 73 | 16 | 17.6 | 2 |
|1928 | 461 | 133,587 | 141,237 | 7,227 | 3,741 | 61.7 | 291,334 | 146,020 | 79 | 13 | 14.5 | ... |
| Long Island1929 | 400 | 49,944 | 54,255 | 16,561 | 565 | 55.2 | 36,880 | 13,517 | 42 | 7 | 14.1 | ... |
|1928 | 396 | 51,842 | 53,982 | 9,885 | 689 | 56.7 | 45,845 | 17,667 | 49 | 7 | 12.1 | ... |
| Pennsylvania System.....1929 | 10,738 | 4,112,891 | 4,696,598 | 454,304 | 136,704 | 59.2 | 9,457,684 | 4,201,717 | 2,433 | 356 | 12.8 | 394 |
|1928 | 10,749 | 4,221,634 | 4,834,396 | 460,798 | 143,942 | 62.0 | 9,780,107 | 4,554,549 | 2,759 | 348 | 11.2 | 583 |
| Reading1929 | 1,451 | 706,740 | 771,569 | 53,110 | 17,457 | 58.3 | 1,261,733 | 617,998 | 335 | 57 | 14.4 | 30 |
|1928 | 1,417 | 683,376 | 750,568 | 52,182 | 18,422 | 59.9 | 1,304,428 | 654,107 | 332 | 81 | 19.7 | 21 |
| Pocahontas Region: | | | | | | | | | | | | |
| Chesapeake & Ohio.....1929 | 2,735 | 1,104,737 | 1,169,527 | 44,260 | 38,394 | 54.5 | 3,196,574 | 1,710,900 | 512 | 92 | 15.3 | 63 |
|1928 | 2,729 | 1,151,207 | 1,240,511 | 48,578 | 39,524 | 55.5 | 3,230,072 | 1,733,251 | 530 | 93 | 15.0 | 38 |
| Norfolk & Western.....1929 | 2,230 | 870,657 | 989,201 | 56,360 | 31,536 | 56.0 | 2,774,808 | 1,480,911 | 443 | 50 | 10.2 | 74 |
|1928 | 2,231 | 882,458 | 1,035,401 | 40,503 | 32,909 | 57.5 | 2,797,074 | 1,486,744 | 501 | 58 | 10.4 | 116 |
| Southern Region: | | | | | | | | | | | | |
| Atlantic Coast Line.....1929 | 5,153 | 621,418 | 623,057 | 9,658 | 15,288 | 58.9 | 865,302 | 300,365 | 414 | 52 | 11.2 | 101 |
|1928 | 5,127 | 674,401 | 677,611 | 8,044 | 17,436 | 58.2 | 991,172 | 353,980 | 446 | 51 | 10.3 | 90 |
| Central of Georgia.....1929 | 1,900 | 254,547 | 256,057 | 4,642 | 6,296 | 67.2 | 343,347 | 137,522 | 132 | 20 | 13.2 | 5 |
|1928 | 1,898 | 272,034 | 273,554 | 3,762 | 6,923 | 73.0 | 358,213 | 150,453 | 137 | 21 | 13.5 | 12 |
| Ill. Cent. (inc. Y. & M. V.)1929 | 6,694 | 1,953,206 | 1,965,495 | 30,646 | 49,123 | 56.4 | 3,433,684 | 1,380,505 | 705 | 131 | 15.7 | 10 |
|1928 | 6,713 | 1,952,521 | 1,961,807 | 28,862 | 52,902 | 60.6 | 3,520,893 | 1,494,824 | 744 | 107 | 12.6 | 19 |
| Louisville & Nashville....1929 | 5,247 | 1,526,384 | 1,611,993 | 47,404 | 31,487 | 56.8 | 2,232,327 | 1,043,026 | 579 | 117 | 16.8 | 30 |
|1928 | 5,242 | 1,613,434 | 1,685,522 | 55,132 | 34,651 | 58.4 | 2,423,984 | 1,160,225 | 617 | 107 | 14.8 | 48 |
| Seaboard Air Line.....1929 | 4,475 | 525,945 | 544,610 | 6,135 | 13,888 | 62.9 | 797,126 | 301,179 | 261 | 53 | 16.9 | 17 |
|1928 | 4,481 | 587,700 | 603,023 | 9,677 | 15,088 | 62.1 | 878,669 | 331,619 | 249 | 60 | 19.4 | 16 |
| Southern1929 | 6,679 | 1,461,116 | 1,490,882 | 31,848 | 35,274 | 61.1 | 2,027,260 | 784,588 | 831 | 128 | 13.3 | 150 |
|1928 | 6,679 | 1,505,368 | 1,535,932 | 31,595 | 37,187 | 62.6 | 2,126,495 | 846,154 | 849 | 116 | 12.0 | 121 |
| Northwestern Region: | | | | | | | | | | | | |
| Chi. & North Western....1929 | 8,475 | 1,338,377 | 1,397,928 | 26,075 | 32,164 | 59.9 | 2,027,494 | 788,022 | 755 | 99 | 11.6 | 79 |
|1928 | 8,463 | 1,390,638 | 1,450,826 | 24,115 | 34,692 | 61.4 | 2,125,120 | 815,249 | 760 | 121 | 13.8 | 109 |
| Chi., Milw., St. P. & Pac.1929 | 11,244 | 1,633,519 | 1,753,136 | 89,425 | 45,066 | 61.3 | 2,817,610 | 1,155,949 | 797 | 151 | 15.9 | 179 |
|1928 | 11,248 | 1,640,884 | 1,756,337 | 98,450 | 48,192 | 63.4 | 2,866,781 | 1,206,870 | 767 | 171 | 18.2 | 142 |
| Chi., St. P., Minn. & Om..1929 | 1,724 | 308,820 | 333,679 | 15,680 | 6,264 | 61.4 | 371,774 | 148,107 | 148 | 26 | 14.9 | 26 |
|1928 | 1,724 | 316,284 | 336,982 | 15,217 | 6,723 | 64.4 | 388,839 | 163,317 | 155 | 31 | 16.8 | 23 |
| Great Northern1929 | 8,340 | 856,505 | 885,178 | 58,608 | 30,117 | 68.1 | 1,769,611 | 807,361 | 490 | 130 | 20.9 | 43 |
|1928 | 8,303 | 1,056,171 | 1,088,967 | 72,879 | 38,523 | 66.5 | 2,386,895 | 1,111,004 | 515 | 116 | 18.4 | 38 |
| Minn., St. P. & S. St. M...1929 | 4,357 | 458,445 | 469,369 | 6,100 | 12,233 | 65.8 | 666,808 | 278,432 | 191 | 45 | 18.9 | 23 |
|1928 | 4,358 | 511,131 | 534,728 | 8,076 | 14,654 | 67.4 | 807,289 | 361,762 | 207 | 41 | 16.5 | 21 |
| Northern Pacific1929 | 6,476 | 786,335 | 829,668 | 47,803 | 24,651 | 66.6 | 1,424,140 | 606,539 | 430 | 106 | 19.9 | 50 |
|1928 | 6,477 | 838,588 | 889,276 | 54,408 | 28,681 | 68.1 | 1,645,412 | 722,019 | 452 | 114 | 20.1 | 42 |
| Oreg.-Wash. R. R. & Nav..1929 | 2,246 | 203,568 | 214,371 | 14,102 | 5,942 | 72.0 | 342,927 | 155,105 | 126 | 19 | 13.1 | 32 |
|1928 | 2,246 | 209,791 | 220,280 | 15,567 | 6,228 | 70.8 | 360,366 | 159,159 | 133 | 11 | 7.9 | 15 |
| Central Western Region: | | | | | | | | | | | | |
| Atch., Top. & S. Fe (incl. P. & S. F.).....1929 | 11,232 | 2,085,648 | 2,247,617 | 107,413 | 62,378 | 56.9 | 4,025,756 | 1,330,259 | 808 | 154 | 16.0 | 89 |
|1928 | 11,193 | 1,901,286 | 2,086,987 | 120 | | | | | | | | |

ared with November, 1928, for Roads with Annual Operating Revenues Above \$25,000,000

| Region, road and year | Average number of freight cars on line | | | Per cent un- serv- ice- able | Gross ton- miles per train- hour, ex- cluding locomotives and tenders | Gross ton-miles per train-mile, ex- cluding locomotives and tenders | Net ton- miles per train- mile | Net ton- miles per loaded car- mile | Net ton- miles per car- day | Car- miles per car- day | Net ton- miles per mile of road per day | Pounds of coal per 1,000 gross ton-miles, including locomotives and tenders | Loco- motive- miles per locomotive- day | |
|----------------------------------|---|---------|---------|---|---|---|---|---|--|-------------------------------------|--|---|--|--|
| | Home | Foreign | Total | | | | | | | | | | | |
| New England Region: | | | | | | | | | | | | | | |
| Boston & Albany.....1929 | 3,448 | 4,483 | 7,931 | 6.6 | 18,367 | 1,259 | 454 | 19.2 | 390 | 31.2 | 7,593 | 179 | 64.7 | |
| 1928 | 2,442 | 5,460 | 7,902 | 3.7 | 18,809 | 1,355 | 514 | 19.9 | 431 | 32.4 | 8,373 | 168 | 62.7 | |
| Boston & Maine.....1929 | 8,324 | 12,283 | 20,607 | 2.5 | 22,188 | 1,758 | 662 | 20.3 | 432 | 32.1 | 4,322 | 112 | 59.5 | |
| 1928 | 9,497 | 12,999 | 22,496 | 3.0 | 20,894 | 1,663 | 662 | 21.1 | 426 | 29.5 | 4,624 | 113 | 60.7 | |
| N. Y., New H. & Hart..1929 | 15,715 | 17,498 | 33,213 | 9.1 | 23,403 | 1,821 | 715 | 21.6 | 352 | 25.3 | 5,558 | 113 | 59.5 | |
| 1928 | 14,949 | 19,529 | 34,478 | 9.2 | 21,455 | 1,693 | 707 | 22.5 | 367 | 24.1 | 6,011 | 113 | 59.2 | |
| Great Lakes Region: | | | | | | | | | | | | | | |
| Delaware & Hudson....1929 | 9,550 | 5,728 | 15,278 | 3.3 | 25,139 | 1,996 | 929 | 29.6 | 666 | 37.2 | 11,622 | 130 | 60.3 | |
| 1928 | 8,446 | 6,686 | 15,132 | 3.0 | 25,332 | 2,023 | 983 | 30.8 | 767 | 39.3 | 13,262 | 139 | 64.0 | |
| Del., Lack. & Western...1929 | 16,071 | 8,772 | 24,843 | 4.6 | 25,357 | 1,986 | 814 | 23.6 | 533 | 34.6 | 13,269 | 139 | 70.1 | |
| 1928 | 15,358 | 9,638 | 24,996 | 3.2 | 23,662 | 1,903 | 820 | 24.7 | 620 | 37.0 | 15,534 | 139 | 81.4 | |
| Erie (inc. Chi. & Erie)..1929 | 31,885 | 21,682 | 53,567 | 3.8 | 34,727 | 2,580 | 1,001 | 24.3 | 568 | 39.8 | 13,137 | 113 | 68.3 | |
| 1928 | 28,260 | 23,964 | 52,224 | 4.0 | 33,234 | 2,629 | 1,078 | 25.4 | 667 | 42.6 | 15,044 | 120 | 72.5 | |
| Lehigh Valley1929 | 18,942 | 9,918 | 28,860 | 6.1 | 26,252 | 1,883 | 773 | 24.9 | 457 | 29.7 | 9,811 | 155 | 59.0 | |
| 1928 | 21,171 | 12,254 | 33,425 | 9.4 | 25,870 | 1,910 | 825 | 26.5 | 507 | 30.7 | 12,619 | 154 | 61.6 | |
| Michigan Central.....1929 | 17,968 | 13,451 | 31,419 | 4.7 | 32,552 | 1,970 | 684 | 21.4 | 363 | 29.3 | 6,263 | 113 | 73.0 | |
| 1928 | 18,120 | 16,757 | 34,877 | 5.6 | 30,290 | 1,935 | 706 | 20.8 | 380 | 29.8 | 7,273 | 111 | 79.5 | |
| New York Central.....1929 | 66,692 | 70,003 | 136,695 | 4.6 | 30,742 | 2,259 | 931 | 26.5 | 490 | 31.9 | 10,355 | 109 | 65.9 | |
| 1928 | 63,262 | 73,762 | 137,024 | 5.9 | 31,141 | 2,373 | 1,000 | 26.3 | 513 | 32.7 | 10,888 | 111 | 63.2 | |
| New York, Chi. & St. L..1929 | 13,655 | 11,317 | 24,972 | 6.5 | 25,411 | 1,778 | 643 | 21.3 | 559 | 44.1 | 8,388 | 113 | 88.1 | |
| 1928 | 12,734 | 11,005 | 23,739 | 6.3 | 26,023 | 1,882 | 714 | 21.4 | 630 | 46.5 | 8,989 | 113 | 74.9 | |
| Pere Marquette1929 | 11,148 | 8,969 | 20,117 | 3.8 | 20,815 | 1,467 | 582 | 24.9 | 440 | 30.4 | 4,062 | 114 | 76.9 | |
| 1928 | 9,506 | 9,849 | 19,355 | 3.8 | 19,527 | 1,519 | 639 | 25.3 | 505 | 32.5 | 4,478 | 111 | 74.9 | |
| Pitts. & Lake Erie.....1929 | 12,030 | 9,080 | 21,110 | 7.2 | 31,053 | 2,774 | 1,502 | 44.8 | 321 | 12.7 | 29,253 | 118 | 78.0 | |
| 1928 | 10,782 | 10,625 | 21,407 | 9.2 | 32,801 | 3,000 | 1,678 | 47.8 | 357 | 13.0 | 33,020 | 112 | 68.7 | |
| Wabash1929 | 16,399 | 13,989 | 30,388 | 1.9 | 28,139 | 1,660 | 597 | 21.4 | 515 | 39.9 | 6,271 | 126 | 78.6 | |
| 1928 | 14,393 | 13,231 | 27,624 | 3.0 | 27,688 | 1,712 | 653 | 21.9 | 609 | 43.7 | 6,742 | 127 | 74.0 | |
| Central Eastern Region: | | | | | | | | | | | | | | |
| Baltimore & Ohio.....1929 | 68,538 | 34,580 | 103,118 | 4.7 | 23,370 | 2,030 | 919 | 31.5 | 573 | 31.3 | 10,666 | 153 | 66.7 | |
| 1928 | 68,844 | 35,459 | 104,303 | 5.2 | 22,854 | 2,037 | 959 | 32.1 | 631 | 32.6 | 11,890 | 152 | 71.5 | |
| Central of New Jersey...1929 | 15,839 | 11,984 | 27,823 | 5.3 | 23,356 | 1,959 | 894 | 31.5 | 584 | 16.0 | 11,462 | 148 | 55.4 | |
| 1928 | 16,416 | 12,613 | 29,029 | 5.7 | 21,406 | 2,001 | 944 | 32.5 | 601 | 16.0 | 12,630 | 157 | 55.0 | |
| Chicago & Eastern Ill...1929 | 12,308 | 4,285 | 16,593 | 42.3 | 26,192 | 1,636 | 723 | 27.0 | 346 | 20.4 | 6,068 | 133 | 48.5 | |
| 1928 | 12,455 | 4,274 | 16,729 | 38.3 | 25,614 | 1,733 | 793 | 29.2 | 423 | 23.1 | 7,479 | 131 | 53.9 | |
| Clev., Cin., Chi. & St. L..1929 | 21,607 | 21,734 | 43,341 | 4.2 | 28,856 | 1,984 | 854 | 28.7 | 494 | 29.4 | 9,027 | 122 | 63.3 | |
| 1928 | 17,980 | 21,313 | 39,293 | 5.2 | 28,079 | 2,073 | 950 | 30.1 | 597 | 32.9 | 9,891 | 121 | 60.2 | |
| Elgin, Joliet & Eastern..1929 | 9,238 | 7,553 | 16,791 | 5.0 | 13,014 | 2,079 | 1,045 | 38.9 | 266 | 11.6 | 9,859 | 139 | 54.8 | |
| 1928 | 8,646 | 7,412 | 16,058 | 4.7 | 16,063 | 2,181 | 1,093 | 39.0 | 303 | 12.6 | 10,569 | 127 | 53.8 | |
| Long Island1929 | 754 | 5,499 | 6,253 | 1.2 | 5,621 | 738 | 271 | 23.9 | 72 | 5.5 | 1,126 | 408 | 48.5 | |
| 1928 | 1,486 | 5,503 | 6,989 | 1.8 | 5,819 | 884 | 341 | 25.6 | 84 | 5.8 | 1,488 | 381 | 38.1 | |
| Pennsylvania System....1929 | 206,439 | 85,185 | 291,624 | 4.4 | 27,664 | 2,300 | 1,022 | 30.7 | 480 | 26.4 | 13,043 | 133 | 61.6 | |
| 1928 | 202,241 | 87,891 | 290,132 | 6.1 | 26,697 | 2,317 | 1,079 | 31.6 | 523 | 26.7 | 14,124 | 129 | 56.8 | |
| Reading1929 | 26,280 | 16,712 | 42,992 | 5.1 | 21,641 | 1,785 | 874 | 35.4 | 479 | 23.2 | 14,192 | 145 | 70.3 | |
| 1928 | 25,256 | 17,088 | 42,344 | 4.4 | 20,511 | 1,909 | 957 | 35.5 | 515 | 24.2 | 15,393 | 146 | 64.8 | |
| Pocahontas Region: | | | | | | | | | | | | | | |
| Chesapeake & Ohio.....1929 | 30,833 | 11,134 | 41,967 | 2.4 | 36,230 | 2,894 | 1,549 | 44.6 | 1,359 | 55.9 | 20,851 | 89 | 67.0 | |
| 1928 | 29,269 | 12,154 | 41,423 | 2.5 | 34,876 | 2,806 | 1,506 | 43.9 | 1,395 | 57.3 | 21,169 | 93 | 68.9 | |
| Norfolk & Western.....1929 | 29,214 | 9,509 | 38,723 | 0.8 | 43,143 | 3,187 | 1,701 | 47.0 | 1,275 | 48.5 | 22,140 | 123 | 70.7 | |
| 1928 | 28,777 | 9,882 | 38,659 | 0.9 | 42,390 | 3,170 | 1,685 | 45.2 | 1,282 | 49.3 | 22,209 | 132 | 64.1 | |
| Southern Region: | | | | | | | | | | | | | | |
| Atlantic Coast Line.....1929 | 23,009 | 8,341 | 31,350 | 4.5 | 20,328 | 1,392 | 483 | 19.6 | 319 | 27.6 | 1,943 | 109 | 45.3 | |
| 1928 | 21,602 | 9,427 | 31,029 | 6.7 | 20,262 | 1,470 | 525 | 20.3 | 380 | 32.2 | 2,301 | 110 | 46.0 | |
| Central of Georgia.....1929 | 4,689 | 4,115 | 8,804 | 4.9 | 19,523 | 1,349 | 540 | 21.8 | 521 | 35.5 | 2,413 | 137 | 57.2 | |
| 1928 | 4,274 | 5,081 | 9,355 | 5.2 | 18,880 | 1,317 | 553 | 21.7 | 536 | 33.8 | 2,643 | 139 | 58.5 | |
| Ill. Cent. (inc. Y. & M. V.)1929 | 41,954 | 23,902 | 65,856 | 3.4 | 24,095 | 1,758 | 707 | 28.1 | 699 | 44.1 | 6,874 | 139 | 80.0 | |
| 1928 | 39,345 | 24,201 | 63,546 | 3.9 | 24,257 | 1,803 | 766 | 28.3 | 784 | 45.8 | 7,423 | 134 | 77.9 | |
| Louisville & Nashville...1929 | 44,975 | 14,631 | 59,606 | 9.8 | 19,751 | 1,462 | 683 | 33.1 | 583 | 31.0 | 6,626 | 148 | 79.5 | |
| 1928 | 43,107 | 17,427 | 60,534 | 9.8 | 18,952 | 1,502 | 719 | 33.5 | 639 | 32.7 | 7,378 | 152 | 80.2 | |
| Seaboard Air Line.....1929 | 15,460 | 7,663 | 23,123 | 6.0 | 19,983 | 1,516 | 573 | 21.7 | 434 | 31.8 | 2,243 | 128 | 58.4 | |
| 1928 | 15,419 | 9,442 | 24,861 | 7.6 | 19,196 | 1,495 | 564 | 22.0 | 445 | 32.6 | 2,467 | 136 | 66.1 | |
| Southern1929 | 49,808 | 18,608 | 68,416 | 12.4 | 20,024 | 1,387 | 537 | 22.2 | 382 | 28.1 | 3,916 | 157 | 52.9 | |
| 1928 | 46,965 | 20,730 | 67,695 | 9.3 | 18,941 | 1,413 | 562 | 22.8 | 417 | 29.3 | 4,223 | 159 | 54.2 | |
| Northwestern Region: | | | | | | | | | | | | | | |
| Chi. & North Western...1929 | 48,452 | 28,090 | 76,542 | 7.4 | 19,908 | 1,515 | 589 | 24.5 | 343 | 23.4 | 3,099 | 142 | 55.6 | |
| 1928 | 45,222 | 29,776 | 74,998 | 6.5 | 20,618 | 1,528 | 586 | 23.5 | 362 | 25.1 | 3,211 | 134 | 55.8 | |
| Chi., Mil., St. P. & Pac..1929 | 53,100 | 22,471 | 75,571 | 2.7 | 22,845 | 1,725 | 708 | 25.1 | 510 | 33.2 | 3,427 | 133 | 64.8 | |
| 1928 | 50,709 | 23,257 | 73,966 | 3.0 | 22,763 | 1,747 | 735 | 25.0 | 544 | 34.2 | 3,577 | 134 | 65.9 | |
| Chi., St. P., Minn. & Om..1929 | 2,500 | 9,351 | 11,851 | 6.9 | 15,952 | 1,204 | 480 | 23.6 | 417 | 28.7 | 2,864 | 132 | 67.2 | |
| 1928 | 2,794 | 9,537 | 12,331 | 6.3 | 16,390 | 1,229 | 516 | 24.3 | 441 | 28.2 | 3,159 | 126 | 63.0 | |
| Great Northern1929 | 40,716 | 13,669 | 54,385 | 3.5 | 25,971 | 2,066 | 943 | 26.8 | 495 | 27.1 | 3,227 | 141 | 50.8 | |
| 1928 | 40,436 | 18,147 | 58,583 | 3.7 | 26,614 | 2,260 | 1,052 | 28.8 | 632 | 33.0 | 4,460 | 132 | 61.4 | |
| Minn., St. P. & S. St. M..1929 | 19,579 | 5,769 | 25,348 | 2.6 | 18,549 | 1,454 | 607 | 22.8 | 367 | 24.5 | 2,130 | 114 | 67.4 | |
| 1928 | 19,462 | 6,728 | 26,190 | 3.2 | 18,872 | 1,579 | 708 | 24.7 | 462 | 27.8 | 2,767 | 109 | 73.0 | |
| Northern Pacific.....1929 | 36,910 | 7,925 | 44,835 | 7.2 | 24,184 | 1,811 | 771 | 24.6 | 451 | 27.5 | 3,122 | 160 | 54.6 | |
| 1928 | 35,662 | 11,528 | 47,190 | 5.9 | 24,927 | 1,962 | 861 | 25.2 | 510 | 29.7 | 3,716 | 152 | 55.6 | |
| Ore.-Wash. R.R. & Nav..1929 | 7,373 | 3,425 | 10,798 | 3.1 | 22,469 | 1,685 | 762 | 26.1 | 479 | 25.5 | 2,302 | 168 | 52.6 | |
| 1928 | 7,511 | 4,520 | 12,031 | 4.6 | 22,465 | 1,718 | 759 | 25.6 | 441 | 24.4 | 2,363 | 173 | 54.4 | |
| Central Western Region: | | | | | | | | | | | | | | |
| Atch., Top. & S. Fe (incl.1929 | 57,577 | 22,011 | 79,588 | 5.7 | 29,728 | 1,930 | 638 | 2 | | | | | | |

News of the Week

(Continued from page 261)

White Sulphur Springs, W. Va. The Pere Marquette will extend its ferry service at Ludington, Mich.

I.C.C. Seeks to Prevent "Leaks"

The Interstate Commerce Commission is "taking drastic action" within its own organization, "on account of leaks involving not only our annual report but other subsequent reports of the commission," according to a letter addressed by Secretary McGinty to the Associated Press, which had informed him it had imposed two fines on one of its members for having printed a "story" taken from the annual report of the commission in December and later some extracts from the text of the report, in advance of the release date set by the commission in giving advance copies to the press. The action is being taken, he said, "to protect the press and the public, as well as the commission, and we hope for such co-operation on the part of the press as will give us better protection in the future than we have had in the past."

W. E. Lee Becomes Member of I. C. C.

The appointment of Judge William E. Lee, of Idaho, as a member of the Interstate Commerce Commission for the unexpired term of Johnson B. Campbell, resigned, which ends on December 31, 1931, was confirmed by the Senate on January 16, following a favorable report by the committee on interstate commerce the day before, and he took the oath of office on January 18. Mr. Lee was born near Asheville, N. C. He was graduated



William E. Lee

from the University of Idaho in 1903 and later completed his legal education at the University of Washington and at the National Law School, in Washington, D. C. He served as secretary to members of Congress from Idaho and later returned to that state and engaged in the general practice of law at Moscow, Satah County. In 1922 he was elected to the supreme court of the state and in 1928 he was re-elected. He told members of the Senate committee that he had no experience in transportation matters.

Commission Denies Order for New Construction

The Interstate Commerce Commission has dismissed complaints filed by the Clarkston Chamber of Commerce, the Lewiston Commercial Club and the Public Utilities Commission of Idaho which had asked it to require the railroads serving Idaho to construct and operate an extension from Lewiston, Idaho, to Homestead, Oregon, 126 miles, or from Lewiston to Clarkston, Wash. The complaints asked that the Northern Pacific, the Oregon-Washington, the Oregon Short Line, the Camas Prairie and the Union Pacific be required to build the line, extend their terminals from Lewiston to Clarkston, and make common use of the line of the Camas Prairie from Lewiston to Riparia, Wash.

The report, by Commissioner McManamy, points out that the commission has held, in the recent Oregon case, that it has authority to require such construction but that such an order would not be justified in this case. The cost of the construction was estimated by the complainants at \$16,933,822 and by the defendants at \$29,590,402. In conclusion the report says:

"While the record will not permit even an approximate estimate of the revenues or earnings which may reasonably be expected from the proposed Lewiston-Homestead line, the conclusion can not be escaped that construction and operation of the line would result in a large deficit. This is true even after considering the proposed diversion of traffic from existing facilities which would still have to be maintained and operated. If a deficit should result from the operation and the present earnings of the carrier are to be maintained, an increase in rates would seem inevitable. The O. W. R. & N. must be largely supported by traffic originating in and destined to Idaho, Oregon and Washington. It is very doubtful that the people of these States would favor the construction if it is not a sound economical proposition and if its construction and operation are likely to result in increased rates.

"The topography of the State and its extensive mountainous areas create a natural condition which would render construction and operation very expensive. The same conditions also prevent any substantial development within much of the area which would be tributary to a north-and-south line. The discussion herein has related to the proposed line following the Snake River. The record indicates that this is the only route which is regarded as at all feasible or practicable. It is true that the people of Idaho have long entertained the thought that this line should be built and their views are deserving of the most careful consideration, but it is quite probable that they have never had the benefit of such a study as this record contains with respect to the cost of construction and the probable financial results of operation. ... "We find that public convenience and necessity have not been shown to justify an order requiring the construction of the Lewiston-Homestead extension."

Traffic

The Canadian National and the Central Vermont have opened a new ticket office in Boston; it is in the Masonic Building, corner of Tremont and Boylston streets.

James McCloskey, New York City passenger agent of the Chicago, Milwaukee, St. Paul & Pacific, has been elected president of the New York City Association of Passenger and Ticket Agents.

The New York Central has changed the schedule of the "Commodore-Vanderbilt," 20-hour train between Chicago and New York. It now leaves Chicago at 3 p.m. instead of 2, and arrives in New York at 12 noon instead of 11 a.m.

The Interstate Commerce Commission has postponed to April 9 the oral argument on the proposed reports on Parts 4 and 4-A of its rate structure investigation, involving rates on petroleum and products, and has extended to March 10, the date for the filing of exceptions.

"The Williamsporter" is the name of a new night train announced by the Central of New Jersey to be put in service on Monday, January 27. It will leave New York at 11:50 p.m. and the corresponding east bound train will leave Williamsport, Pa., at 10:45 p.m., each train running through in about seven hours.

The Container Corporation of America, Chicago, has acquired the Sefton Manufacturing Corporation, Chicago, and its subsidiary, the Dixon Board Mills, Inc. The entire personnel of the Sefton Company will be retained, Wesley M. Dixon, president, becoming a director of the Container Corporation.

The Southeastern Claim Conference convened at Miami, Fla., during the week of January 6, to discuss means of improving the packing, loading and handling of fresh fruits and vegetables. Officers elected were: Chairman, J. A. Baumgardner, general freight claim agent of the Southern; vice-chairman, D. A. Stewart, freight claim agent of the Gulf, Mobile & Northern; and secretary, W. O. Wall, general claim agent of the Georgia & Florida (re-elected).

A sheep instruction train is the latest novelty in the railway traffic field. Announcement of it comes from Winnipeg, whence the Canadian National has started such a train to tour the principal points on its system from which sheep were shipped during the past year. The railroad co-operates with associations of wool growers and other organizations interested. There will be lectures at all points where the train stops, and there is also a demonstration car.

The Union Pacific has filed with the Interstate Commerce Commission a motion to dismiss the complaint filed by the

Pickwick-Greyhound Lines, Inc., which attacked the legality of the road's acquisition of control of the Interstate Transit Lines. It is averred that the complaint does not state a cause of action and that the commission is without jurisdiction to hear and determine any issue sought to be raised by the complaint.

The Houston Passenger Club was organized at Houston, Tex., on January 10 with a membership of 36 passenger representatives. The officers elected are: President, V. W. Baker, district passenger agent of the Wabash; first vice-president, Morey Bering, depot ticket agent of the Missouri Pacific, second vice-president, J. A. Taylor, passenger agent of the Southern Pacific; and secretary-treasurer, C. A. Lastinger, passenger agent of the Louisville & Nashville.

Train Secretaries

The "train secretary" on de luxe trains has become so important on the Pennsylvania that two supervising train secretaries have been appointed. A. J. Campbell and C. V. Bremser, employees in this branch of the service, have been appointed to the new positions. The former supervises the secretarial work on the Broadway Limited, the Golden Arrow, the Pennsylvania Limited and the Liberty Limited, and the latter that on the American, the Spirit of St. Louis and the Airway Limited.

Construction of New Jersey Canal Advocated

Construction of a ship canal across the state of New Jersey connecting the Delaware & Raritan rivers and forming part of an inland waterway system along the Atlantic seaboard was advocated by members of Congress and others at a hearing before the Board of Engineers for Rivers and Harbors at Washington on January 21. A favorable report on the project has been rendered by the district engineer for the New York district, estimating the cost at \$90,000,000. J. Hampton Moore, president of the Atlantic Deeper Waterways Association, urged the board to adopt a formal report that would place the question before Congress.

The Malolo Boat Train

The Matson Line, operating steamships between San Francisco and Honolulu, advertises a "boat train" direct from New York, in which passengers make the complete transcontinental journey without changing cars. This service was inaugurated on January 21, when passengers started from New York by the Twentieth Century Limited of the New York Central and the Broadway Limited of the Pennsylvania. The schedule called for departure from Chicago at 11:50 a. m. on January 22 (Overland Limited) by the Chicago & North Western-Union Pacific-Southern Pacific. The train was to arrive in San Francisco on January 24 in the evening and the steamship leaves Saturday at noon. The schedule time through from New York to Honolulu is

eight days, or three days less than the time heretofore usually taken for the trip. It is proposed to run the second "Malolo boat train" from New York on February 18.

Canadian Traffic League Banquet

Some 600 railway and industrial executives attended the fourteenth annual banquet of the Canadian Industrial Traffic League at the Mount Royal Hotel in Montreal on January 24. Members of the league from Halifax to Vancouver and from all over the United States were present. The banquet was addressed by E. W. Beatty, chairman and president of the Canadian Pacific, and E. J. C. Finch, president of the League, presided.

Formed in 1916, the league has dealt with many important questions in the transportation life of Canada. It has adjusted traffic problems by discussion with representatives of the carriers with such success that no recourse to the Board of Railway Commissions has yet been found necessary.

Atlantic Board Sees Possible Traffic Increase

The Atlantic States Shippers' Advisory Board held its regular meeting in New York City on January 17. The reports of commodity committees indicate that as a whole the shippers in this territory will, in the current quarter, require about the same number of cars as they used last year, or possibly a slightly larger number. The commodities in which some decreases in movement is predicted are: automobile parts, brick, clay products, iron and steel, roofing material, salt and slate. Those in which increases are expected are: Coal, coke, canned foods, dairy products, fertilizer, gravel, sand and stone; gypsum, leather goods, lime, paper, paper board, petroleum, poultry, sugar, syrup, and vegetables.

Clarifying the Hoch-Smith Resolution

Senator Brookhart, of Iowa, has introduced in the Senate a resolution directing the Interstate Commerce Commission "to immediately readjust the railroad freight rates for all products of agriculture, including livestock," and to "reduce such rates to meet the general level on a tonnage basis of railroad freight rates for other products." "If such reduction is not compatible with the maintenance of adequate transportation service," says the resolution "then the deficiency shall be removed by raising the rates on other products to meet the lower level of agricultural products, and the general level of all rates shall not be advanced."

The Senator said he had received from a member of the commission a letter showing that farmers furnished 11.49 per cent of the tonnage but are paying 20.31 per cent of the freight rates. Continuing, he said, "this means that agricultural rates are 76.85 per cent too high. Congress passed one resolution upon this subject known as the Hoch-Smith resolution, but the commission has failed to carry out its spirit. I am therefore introducing another

resolution which is definite enough to compel action."

Western Canada Rate Case Before Privy Council

It is provided in the Railway Act of Canada, which set up the Dominion Board of Railway Commissioners, that appeals from orders of the Board on questions of law must be made to the Supreme Court of Canada and on questions of fact to the Privy Council (Federal Cabinet). To this latter body early in the month of October last the provinces of British Columbia, Alberta and Saskatchewan made appeals from orders of the Railway Board, arising out of the general equalization of freight rates case of two or three years ago, in regard to the removal of the Rocky Mountain differential, the rates on eastbound fruit from British Columbia to the prairie provinces, the domestic rates on grain and flour westbound to Vancouver, and what are known as terminal rates in which is involved the question of constructive mileage between Winnipeg and Fort William. That hearing lasted nearly a week, and since then there has been a modified appeal application made to the Privy Council by Saskatchewan which necessitated another hearing. That occupied January 16 and 17. A decision will be announced by the Cabinet at a later date, although it was made rather clear in the progress of Friday's argument by Premier Mackenzie King that he did not think the Cabinet should be called on to deal with freight rates. A strong plea was made both by counsel for the railways and for Manitoba and Ontario interests that a speedy end be made of this particular freight rate controversy.

"We put forward the view, seriously," said W. N. Tilley, one of the counsel appearing for the Canadian Pacific, "that it would be a great mistake to continue this particular freight rate controversy any longer. We were ordered into this controversy in 1925, and it was a year and a half after the orders of the Railway Board became effective that an appeal from them was first made by G. G. McGreer, K.C., for the province of British Columbia, an appeal which, because of certain events, has since become an appeal for certain private interests. It is a serious burden for the railways to have to continue preparing statistics for such inquiries and answering the various charges made. The result is satisfactory neither to the railways nor to the provinces concerned. The provinces disagree amongst themselves as to the remedies that should be adopted; they at any rate do not agree upon the important thing that is wrong. This disagreement amongst the appealing provinces is pretty good evidence that the Railway Board did a reasonably good job, and that its orders should be allowed to remain."

Alistair Fraser, for the Canadian National declared that the Privy Council could not find that a freight rate was too high and neither could the Privy Council order the Railway Board to reduce rates. The Privy Council was not a rate making body, and for that reason the appeals should be dismissed.

Foreign

Motion Picture of New Soviet Railroad Received Here

A new motion picture, prepared by the Soviet Union, and dealing with the construction of the new Turkestan-Siberian Railway, has been recently received by the Amtorg Trading Corporation, New York, the official American agent of the Soviets. The first half of the five-reel film shows the country through which the line will pass, and demonstrates its economic importance to the people of central Asia, while the second half is devoted to actual construction operations, in the course of which engineering difficulties of considerable magnitude had to be overcome. The new railway shortens the distance between Siberia and Tashkent, the chief city of central Asia, by about 1,000 miles, and provides the latter region with a new route for the importation of Siberian grain, timber and minerals and for the export of cotton.

Gage Conversion in India

Conversion of the 90-mile section of the South Indian Railway between Erode and Trichinopoly from a meter to a 5 ft. 6 in. gage line was recently accomplished without interruption to traffic. The process of conversion was outlined in a recent issue of the *Railway Gazette* (London).

The line running from Erode to Trichinopoly, the article points out, was originally built to a 5 ft. 6 in. gage in 1868 as an extension of the Great Southern of India. During the next few years there was considerable activity in railway construction in this district, as the South Indian built a meter-gage trunk line from Madras to Tuticorin with branches to other important centers. It was thus desirable to convert the original line from Erode to Negapatam from the broad to the meter gage in order to permit interchangeability of the rolling stock. This was accomplished in 1879. During the latter part of 1929, however, the reconversion to the 5 ft. 6 in. gage became part of a program for the construction of shop facilities at Trichinopoly to service both broad and meter gage rolling stock.

The conversion plan involved the laying of a third rail throughout the length of the line, leaving gaps only at points where switches and crossings for meter-gage trains were located. The work of strengthening bridges and altering building and other roadside facilities was carried on while the meter-gage trains continued to operate. Switches and crossovers for the broad gage trains were constructed in the meantime and placed at points where they were to be installed. When the day came for actual conversion, it was found necessary only to make certain minor changes in train schedules, in order to permit the installation of the broad gage switches and cross-

overs at the more important stations with their extensive sidings.

On the actual date of conversion, the last meter-gage train to run on the section left Erode at 6:20 a. m. and as it passed each station a specially selected track-labor crew commenced the removal of meter-gage connections and the installation of broad gage switches and crossovers. The first broad-gage train started two hours later, preceded by a rail car with an inspection crew. It arrived at Trichinopoly just five hours after the arrival of the last meter-gage train.

Standard Steel Car to Finance Polish Equipment Purchases

Arrangements have recently been consummated between the Polish government and the Standard Steel Car Corporation whereby the latter will undertake to finance equipment purchases for the Polish State Railways, it has been announced by the American Polish Chamber of Commerce, New York. The agreement marks the institution of a new system of financing Polish production by foreign capital.

The arrangements, according to the chamber, were effected through the purchase of a block of stock by the Standard Steel Car Corporation in the Polish firm of Lilpop, Rau & Loewenstein. The latter concern will, under the terms of the contract, deliver during a period of seven years 14,000 freight cars and 1,000 passenger coaches on long term credits amounting to \$20,000,000. In addition, the Standard Steel Car Corporation will extend to Lilpop, Rau & Loewenstein a credit of \$1,000,000, the proceeds of which will be utilized to increase production.

Payment for the equipment will be made by the Polish State Railways in semi-annual instalments, 85 per cent of each instalment to be in treasury notes and 15 per cent in cash. The rate of interest has been fixed at the same level as on collateral loans extended by the Bank of Poland, at present 9½ per cent. The transaction will be financed by the Standard Steel Finance Corporation of America.

The arrangement is viewed as of great significance to the future of the Polish railway systems, particularly in view of the fact that considerable funds which otherwise would have been employed to increase the rolling stock can now be diverted to the construction of new lines, especially that between Upper Silesia and Poland's port of Gdynia.

Figures recently compiled by the Polish Ministry of Communication show that the State Railway system now has in operation more than 5,500 locomotives, 12,300 passenger cars and 152,700 freight cars, operating over lines some 19,500 kilometers (12,130 miles) in length. During 1928 the railroad carried more than 175,000,000 passengers, 365,000 tons (metric) of baggage, more than 530,000 tons of express shipments and 77,000,000 tons of ordinary freight. Although official figures for 1929 have not yet been made public, it is estimated that there was a substantial increase over 1928.

Equipment and Supplies

Locomotives

THE ALTON & SOUTHERN is inquiring for one switching locomotive.

THE CENTRAL OF NEW JERSEY is inquiring for five eight-wheel switchers and five Pacific type passenger locomotives.

THE ST. LOUIS SOUTHWESTERN has ordered ten 4-8-4 type locomotives from the Baldwin Locomotive Works. Inquiry for this equipment was reported in the *Railway Age* of December 7.

THE INTERNATIONAL RAILWAYS OF CENTRAL AMERICA have ordered three 2-8-2 type locomotives from the H. K. Porter Company. Inquiry for this equipment was reported in the *Railway Age* of December 28.

THE GREAT LAKES STEEL CORPORATION has ordered two 70-ton, 300-hp. oil-electric switching locomotives from the Westinghouse Electric & Manufacturing Company. These locomotives are for use in its Detroit, Mich. plant.

Freight Cars

THE TEXAS & PACIFIC is inquiring for 25 underframes for freight cars.

THE NEW ORLEANS GREAT NORTHERN has ordered 200 gondola cars of 50 tons capacity from its own shops.

THE UNION OIL COMPANY OF CALIFORNIA has ordered 60 tank cars from the General American Tank Car Corporation.

SWIFT & COMPANY has ordered 300 underframes from the Bettendorf Company. Inquiry for this equipment was reported in *Railway Age* of December 7.

THE TEXAS COMPANY has ordered 50 tank cars of 12,000 gal. capacity, 25 tank cars of 10,000 gal. capacity for carrying asphalt and 250 insulated tank cars of 10,000 gal. capacity from the American Car & Foundry Company. The Petroleum Iron Works will build 600 tank cars to be operated by the Texas Company under lease. Inquiry for 500 cars was reported in the *Railway Age* of November 16.

THE LOUISVILLE & NASHVILLE is now inquiring for the 1,800 freight cars authorized in December and reported in the *Railway Age* of December 14. The inquiry calls for cars of the following types:

| | Length | Capacity |
|------------------------|--------------|----------|
| 500 gondola cars | 40 ft. | 50 tons |
| 250 gondola cars | 45 ft. | 70 tons |
| 300 hopper cars | 34 ft. 6 in. | 50 tons |
| 500 box cars | 40 ft. 6 in. | 50 tons |
| 250 flat cars | 46 ft. 9 in. | 50 tons |

Passenger Cars

THE CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC is inquiring for two dining cars.

THE INTERNATIONAL RAILWAYS OF CENTRAL AMERICA have ordered five first-class coaches, seven second-class coaches and three baggage cars from the American Car & Foundry Company. Inquiry for this equipment was reported in the *Railway Age* of December 28.

Machinery and Tools

THE CHICAGO, ROCK ISLAND & PACIFIC is inquiring for a 36-in. lathe, a 34-in. drill and a hydraulic brushing press.

THE MISSOURI-KANSAS-TEXAS is inquiring for a motor-driven mud ring and flue sheet drill and two turret lathes.

THE CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC is inquiring for an 18-in. by 3-in. grinder.

THE CHICAGO & ALTON is inquiring for a journal turning machine, a riveter, a stay-bolt cutter and a three-ton electric hoist.

THE ATCHISON, TOPEKA & SANTA FE is inquiring for the following machine tools:

| | |
|---------------------------------|---------------------------------|
| 1 six-foot radial drill | 1 bench grinder |
| 2 90-in. journal turning lathes | 1 24-in. by 3-in. floor grinder |
| 1 36-in. by 34-ft. lathe | 1 24-in. by 10-ft. lathe |
| 1 axle lathe | 1 flue sheet drilling machine |
| 1 car-wheel borer | 1 250-lb. power hammer |
| 2 36-in. shapers | 1 high-speed cut off saw |

Iron and Steel

THE ERIE is inquiring for 200 tons of steel for some bridges.

THE NEW YORK CENTRAL has ordered 200 tons of steel from the McClintic-Marshall Company for a bridge at Nyack, N. Y.

THE MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE has ordered 8,000 tons of rails, dividing the order among the Illinois Steel Company, the Inland Steel Company and the Bethlehem Steel Company.

THE PENNSYLVANIA is inquiring for 14,000 tons of fabricated steel for electrical work, also for 400 tons of steel for bridges at Harrisburg, Pa., and has ordered about 300 tons for a building at Jersey City, N. J. from the Bethlehem Fabricators, Inc.

Signaling

THE ALTON & SOUTHERN has ordered from the Union Switch & Signal Company material for an electric interlocking at the crossing of the Mobile & Ohio at Monsanto, Ill.

The Southern has opened a new freight station at Burlington, N. C., to care for increased freight traffic from new industries recently located there. The freight house, of fire-proof construction, is 50 ft. by 206 ft. with a capacity of 28 cars and is connected with a two-story office building 36 ft. by 50 ft. Team tracks with a capacity of 38 cars and automobile platforms accommodating 7 cars have also been provided.

Supply Trade

The Pyle-National Company, Chicago, has moved its Boston office to room 901 Statler building.

Clyde G. Conley, vice-president and secretary of the Mt. Vernon Bridge Company, Mt. Vernon, Ohio, has been elected president to succeed I. M. Wolvertson, deceased.

The Ohio Brass Company, Mansfield, Ohio, has opened a branch office in the Northern Life Tower at 1218 Third avenue, Seattle, Wash. in charge of J. W. Watkins.

Hal W. Reynolds, has been appointed direct factory representative of the Taft-Peirce Manufacturing Company, Woonsocket, R. I., with headquarters at 1724 St. Clair avenue, Cleveland, Ohio.

L. J. Dicianne, branch manager of the Minneapolis, Minn., office of the Wagner Electric Corporation, St. Louis, Mo., has been transferred to Kansas City, and has been succeeded by Major Elam, representative at St. Louis.

The O'Brien Equipment Company, 2726 Locust boulevard, St. Louis, Mo., has been appointed exclusive distributor in the Missouri territory of the products of the Mason Regulator Company, Boston, Mass.

Arthur M. Long, who has been in charge of the tin plate sales of the Youngstown Sheet & Tube Company, has been appointed assistant general manager of sales with headquarters at Chicago.

S. E. Linderman has been appointed publicity manager of the United States Pipe & Foundry Company, Burlington, N. J. to succeed J. D. Capron, who has resigned to become general manager of the Glamorgan Pipe & Foundry Company, Lynchburg, Va.

The General Refractories Company, Philadelphia, Pa., has acquired all of the refractories properties of Evens & Howard Fire Brick Company, St. Louis, Mo. The refractory plants of the Evens & Howard Fire Brick Company will in future be operated by the General Refractories Company as the Evens & Howard division.

Wilfred R. Wood and the Irving Trust Company, receivers of the Combustion Engineering Corporation, New York, announce the appointment of Joseph V. Santry as head of that organization to succeed Col. H. D. Savage, who is assisting the receivers. Mr. Santry, who became identified with Combustion Engineering Corporation shortly after its organization in 1914, served successively as director and vice-president in charge of sales for five years and as president for four years, resigning about two years ago.

The Universal Atlas Cement Company, Chicago, has been organized as

a subsidiary of the United States Steel Corporation to take over the business of the Atlas Portland Cement Company, New York, and the Universal Portland Cement Company, Chicago, following the purchase of the Atlas Portland Cement Company and its subsidiaries, the Atlas White Portland Cement Company and the Atlas Lumnite Cement Company by the Steel Corporation. B. F. Affleck, president of Universal Portland Cement Company, has been elected president of the new company while F. E. Guy, eastern traffic manager of Universal, has been appointed traffic manager of the new company.

Norman C. Naylor, who has been appointed vice-president of both the American Locomotive Company and the Railway Steel Spring Company, with headquarters at Chicago, was born in Rochester, N. Y., on June 3, 1881, and entered the employ of McKee-Fuller & Co. on September 8, 1895. In June, 1896, he left this company to attend school in Colorado, after which, on



Norman C. Naylor

July 5, 1898, he entered the employ of the Steel Tired Wheel Company. He became associated with the Railway Steel Spring Company in 1902, when the former company was merged with the latter. In December 1916, he was appointed sales agent in the Chicago district and in November 1926, was appointed district sales manager of both the American Locomotive Company and the Railway Steel Spring Company, which position he has held until his recent appointment as vice-president as above noted.

John F. Schurch, formerly president and later until 1928 chairman of the board of Manning, Maxwell & Moore, Inc., has been elected vice-president of the Chatham Phenix National Bank and Trust Company, with headquarters at a new branch to be opened shortly in the Lincoln building, New York City. Mr. Schurch has been identified for many years with the railway supply business in an executive capacity having served as president of the Damascus Brake Beam Company, Cleveland, Ohio, vice-president of the Symington Com-

pany, Rochester, N. Y., president of the Locke Insulator Manufacturing Company, Rochester, and then as president of Manning, Maxwell & Moore, Inc., succeeding John M. Davis when the latter was elected president of the Delaware, Lackawanna & Western. In 1927 Mr. Schurch became chairman of the board of Manning, Maxwell & Moore, Inc., from which position he retired in 1928. He subsequently served as president of the San Francisco Publishing Company and reorganized the San Francisco Bulletin prior to its sale to the Hearst interests. Since that time he has been a special partner of Brayton, Butler & Cooke, members of the San Francisco stock exchange. In 1922 Mr. Schurch served as president of the Railway Supply Manufacturers' Association.

John D. Finn, who has been appointed secretary of the **American Locomotive Company**, with headquarters at New York, was born on August 5, 1884, at Jersey City, N. J., and after graduating from high school he attended Keystone School of Music. In 1901 he entered the employ of the Erie in the motive power department. In October, 1905, he took a similar position with the



John D. Finn

Chicago, Rock Island & Pacific. Mr. Finn entered the employ of the American Locomotive Company at its Schenectady plant in September, 1907, and was transferred to New York in August, 1918, as chief clerk in the corporate department. On November 6, 1919, he was appointed assistant secretary, which position he held until his recent appointment as secretary.

Harry S. Banghart who has been appointed assistant secretary of **American Locomotive Company**, with headquarters at the general office, New York City, was born on November 15, 1876, at Phillipsburg, N. J. He entered the employ of the Lehigh & Hudson River as telegraph operator in 1896 and four years later went with the Delaware, Lackawanna & Western as telegraph operator and agent at Bloomfield, N. J. In June, 1902, he left railroad work to enter the service of the Railway Steel

Spring Company; he was appointed assistant treasurer in 1908, and in 1919 was made treasurer of that company. Following the merger of the Railway Steel Spring Company with the American Locomotive Company in 1926, Mr.



Harry S. Banghart

Banghart was appointed assistant treasurer of the latter company, which position he still retains in addition to his recent appointment as assistant secretary.

H. K. Porter, who has been appointed general sales manager of the **Hyatt Roller Bearing Company**, Newark, N. J. was born at Atlanta, Ga., and was educated at Alabama Polytechnic Institute, Auburn, Ala., where he studied mechanical engineering and was graduated in 1910. Shortly after he joined the staff of the United States Metal & Manufacturing Company, and served as its southern sales agent of railway supplies for several years. Mr. Porter became a member of the industrial sales department of the Hyatt Roller Bear-



H. K. Porter

ing Company, at Newark, in 1916. He subsequently served successively as head of its mine car bearings division, the eastern sales division and for a number of years supervised the Hyatt railroad bearings sales as assistant to the general sales manager. He later was appointed assistant general sales manager and now becomes general sales manager of the same company.

Obituary

John H. Mitchell, general sales manager of the Standard Steel Car Company, with headquarters at Pittsburgh, Pa., died suddenly on January 16 while on a visit to the New York office of the company. Mr. Mitchell was born on August 30, 1872, at New Brighton, Pa. After graduating from Cornell University in 1896 as a mechanical engineer, he entered the service of the Pittsburgh & Lake Erie, as an engineer. Several years later he went with the Pressed Steel Car Company as western sales manager and 18 years later he served as acting president of the American Steel Company, Havana, Cuba, where he remained for three years and on his return to the United States became general sales manager of the Standard Steel Car Company.

Abram Francis Huston, chairman of the board of the Lukens Steel Company, died on January 12 at his home, Coatesville, Pa. Mr. Huston was born on July 7, 1852, and was educated at Taylor Academy and at Haverford College, from which he was graduated in 1872 with the degree of bachelor of arts. On leaving college he at once entered the employ of the Lukens Iron Works and served in the mill. He held positions in various departments after which he served as bookkeeper, purchasing agent and sales agent. In 1882 when his father retired from the management, he was put in control of the business. In 1890 the company was incorporated under the name of the Lukens Iron & Steel Company. In 1897 Mr. Huston was elected president of the company which has been known since 1917 as the Lukens Steel Company; in 1925 he became chairman of the board which position he held at the time of his death. In 1902, Mr. Huston was elected president of the Association of Steel Manufacturers and to the chairmanship of its executive committee. At the time of his death, he was a director of many industrial organizations.

Trade Publications

PORTABLE TEST CAR—"The Waugh Portable Test Car" is the title of a booklet just issued by the Waugh Equipment Company, Depew, N. Y., describing the new Waugh portable test car, through the use of which all types of draft gears can be tested without their removal from actual service on freight or passenger equipment. The test car makes a complete record of each gear on a special chart. The exact amount of free slack is recorded, and a characteristic performance curve shows the exact travel and release of the gear up to the capacity of the test car. With this car it is estimated that an average of fifty gears a day can be tested.

Construction

BOSTON & MAINE.—The Public Service Commission of New York has approved as not excessive the bid submitted by the Shoemaker Bridge Company, Pottstown, Pa., for furnishing and erecting structural steel required for the elimination of the Valley Falls-Johnsonville county highway crossing of this company's tracks near Johnsonville, N. Y., at a cost of \$30,431.

CANADIAN NATIONAL.—This company plans the construction of an addition to its yard at Tecumseh, Ont., involving six to eight yard tracks which will add 500 cars capacity.

CANADIAN NATIONAL.—A contract for the construction of a connection about two miles long with the grain elevator of the Canada Steamship Company at Kingston, Ont., at a total cost of about \$100,000, has been let to the Rayner Construction Company, Toronto, Ont.

CANADIAN NATIONAL.—In addition to projects reported in previous issues of the *Railway Age*, this company's program for improvements to be made during 1930 includes the following work: Additions to terminal facilities at Yarmouth, N. S.; continuation of work on a new engine terminal now under construction at Charlottetown, P. E. I.; the installation of a 100-ft. turntable at St. John, N. B.; the construction of a 350-ton coaling plant at Campbellton, N. B.; the building of new stations at Riviere du Loup, Que., and at Parry Sound, Ont.; additions to yard and terminal facilities at Sarnia, Ont.; the construction of storage tracks at Prescott, Ont.; the erection of a coaling plant at Mimico, Ont.; the construction of a five-mile spur line from St. Eustache, Que., to sand deposits near Oka, and the installation of automatic block signals between Belleville and Brockville, Ont. Approximately \$10,000,000 will be spent during the year in connection with the \$50,000,000 Montreal terminal plan, most of this amount going toward grade separation by the construction of subways and overhead bridges. Work is also to be continued on the \$5,000,000 seven-year program for the improvement of the Point St. Charles shops at Montreal, with the construction of a new foundry, oil storage facilities, garage, firing-up shed, service building, sewer and water connections, main steam duct and new trackage planned for the current year. Additional work to be done at Montreal during 1930 includes the improvement and extension of fruit handling facilities at Bonaventure station, the construction of new industrial spur tracks in the east end of the city and the erection of a new office building at the Montreal stock yards, to complete the improvement program at that point.

CANADIAN PACIFIC.—The general contract for the construction of a 21-story addition to the Royal York hotel at

Toronto, Ont., has been awarded to Anglin & Norcross. A contract for the steel work has been let to the Dominion Bridge Company. The addition, which will contain 160 rooms, will involve an expenditure of \$839,500.

CANADIAN PACIFIC.—This company has completed the installation of a new 100-ft. turntable at London, Ont., to replace the former 70-ft. turntable, and has been authorized to proceed with the filling in of certain parts of the trestle approaches to bridge 58.42, on its Port McNicoll subdivision. The work of double tracking the Cartier subdivision between Azilda and Sudbury, Ont., 7.3 miles, for which bids were asked in October, as reported in the *Railway Age* of October 26, 1929, has been indefinitely postponed.

CHESAPEAKE & OHIO.—Contracts have been let to the Boxley Brothers Company, Orange, Va., for the replacement of the existing steel span of bridge No. 200, over Willey road, Fernald, Ohio, with a through plate girder span on concrete abutments, at an approximate cost of \$31,500, and to the Hunt-Forbes Construction Company, Huntington, W. Va., for the rebuilding of Upton Creek arch at Spring Hill, W. Va., at a probable cost of \$31,000.

CHICAGO, ROCK ISLAND & PACIFIC.—A contract has been awarded to the Railroad Water & Coal Handling Company, Chicago, for the construction of wells and pipe lines at Shawnee, Okla. This project, which involves an expenditure of about \$50,000, has been made necessary through the pollution of the present wells by salt water from oil well operations in the vicinity.

CITY OF MONTREAL.—The City Council has awarded to St. George & Gauvreau & Company a contract for the construction of a tunnel under the Canadian Pacific tracks at Jean Talon street, to provide traffic facilities required by the construction of the railroad company's north end station. The tunnel, which is to be 700 ft. long and 74 ft. wide, will be of reinforced concrete and steel construction. The city also plans to award a contract in the near future for the construction of a subway under the Canadian Pacific tracks on Park avenue.

DAYTON & UNION.—Contract for the construction of a track elevation project at Dayton, Ohio, has been awarded to the M. E. White Company, Chicago, for \$435,000.

DELAWARE & HUDSON.—A contract has been awarded to S. A. Scullen, Inc., Cohoes, N. Y., for the construction of a side line to eliminate two grade crossings at Round Lake, N. Y.

DELAWARE & HUDSON.—Specifications and estimates of cost amounting to \$105,000 for the elimination of Beardsley's crossing in Peru, N. Y., have been approved by the Public Service Commission of New York.

GRAYSONIA, NASHVILLE & ASHDOWN.—A contract for the construction of a one-

story brick, concrete and stucco passenger station at Nashville, Ark., has been let to A. B. Cupp & Son, Nashville.

GULF & WEST TEXAS.—The Interstate Commerce Commission has authorized this company to construct a line from Fredericksburg, Tex., northwesterly to Brady, 69 miles, and from Eden northwesterly to San Angelo, 44 miles, and to operate under trackage rights over the Colorado & Southern between Brady and Eden 32 miles, or construct its own line between those points. The estimated cost of construction is \$5,852,665 and the company is permitted to retain free from recapture its excess earnings for a period of ten years.

LOUISVILLE & NASHVILLE.—A contract for the construction of a brick and concrete warehouse at Goulding yard, Pensacola, Fla., has been let to the W. Horace Williams Company, New Orleans, La. This structure, which will have outside dimensions of 40 ft. by 400 ft., will involve an expenditure of about \$250,000.

NEWFOUNDLAND.—The International Pulp & Paper Company is piling, cribbing and raising 2,000 ft. of this company's track along the Sandy Pond diversion, near Howley, Newfoundland. The work was necessitated by the construction of a dam at Junction Brook which flooded a large part of the Howley and Sandy Pond area.

RUTLAND.—The New York Public Service Commission has approved estimates of cost totaling \$33,000 for the substructure, superstructure and falsework in connection with an overhead highway bridge to eliminate the Mooers Forks-Ellenburgh crossing at Mooers, N. Y.

SABINE BASIN.—The attorney general of Texas, on January 17, approved the charter of this company, which contemplates the construction of a railroad between Beaumont, Tex., and Port Arthur, about 20 miles. The company is incorporated for \$250,000.

Construction of Mexican Bridge Resumed

After a lapse of 18 years, work on the steel bridge across the Panuco river on the railroad which the Mexican government is constructing between Tamos, near Tampico, and a point on the National of Mexico near Honey, State of Puebla, has been resumed. The contract for the erection of the remaining part of the structure has been let to F. M. Arizmendi & Company, Mexico City. The construction of the bridge was started in 1912, but the work was abandoned, due to revolutionary troubles, after part of the steelwork had been finished. Exposure to the weather has caused the existing steel spans to become rusted, and the contract for scaling and painting the old structure has been let to the DeVilbiss Company, New York. The completing of this bridge will enable the more rapid construction of the railroad which is designed to afford a direct rail route between Tampico and Mexico City.

Financial

BALTIMORE & OHIO.—Ordered to Divest Itself of Western Maryland Stock.—The Interstate Commerce Commission has found that the acquisition by the B. & O. of 42.8 per cent of the stock of the Western Maryland was the desire to prevent Section 7 of the Clayton anti-trust act, as the effect may be to substantially lessen competition between the two roads, and has ordered the B. & O. to divest itself of the stock within six months, with a provision that none of the stock shall be sold directly or indirectly to any stockholder or anyone directly or indirectly connected with the B. & O. The report says the record raises the presumption that one of the reasons for the desire of the respondent to acquire control of the Western Maryland was the desire to prevent its acquisition by some other system which would be able through the use of its lines to offer more effective competition to the respondent and that the mere holding of a controlling proportion of the stock would deprive the Western Maryland of force as a competitor. The B. & O. had taken the position that it had acquired the stock as an investment, to be held until authority for its permanent retention could be obtained. Commissioners Farrell, Brainerd and Woodlock dissented.

CENTRAL VERMONT.—Holding Company.—This company has organized a holding company to be known as the Centmont Corporation to take over non-carrier properties and securities of such subsidiary companies which are not a part of the company's railroad operations. The holding company will issue 500 shares of \$100-par common stock and 11,000 shares of no-par preferred stock, paying a dividend of \$6 a share and callable at \$103. The common stock of the holding company and 9,875 shares of the preferred will be delivered to the Central Vermont as the purchase price of properties to be transferred. The Central Vermont will use the securities it receives to place it in funds for the purpose of making additions and betterments.

CHICAGO, MILWAUKEE, ST. PAUL, & PACIFIC.—Reorganization Expenses.—The Interstate Commerce Commission has issued a supplemental report on the reorganization plan authorizing the company to pay, from moneys received by it from the payment of \$4 a share by stockholders of the old company, not exceeding \$107,165 for services and disbursements of Coverdale & Colpitts, consulting engineers.

COLORADO & SOUTHERN.—Acquisition.—This company has applied to the Interstate Commerce Commission for authority to acquire by deed the properties of the Colorado Railroad, 140.49 miles of line, now operated by the C. & S. under lease. The C. & S. now owns all the stock and proposes to assume the debts.

DELAWARE & HUDSON.—Transfer of Railroad Properties Approved.—The Interstate Commerce Commission has approved

the application of the D. & H. Company for authority to transfer its railroad properties and operations to the Delaware & Hudson Railroad Corporation, which will assume obligation and liability in respect of the securities of the D. & H. and issue its new stock to the D. & H. for the properties. Upon the transfer the D. & H. Company will become merely a holding company. It had previously divested itself of all interest in the anthracite industry except as a stockholder of the Hudson Coal Company. It will retain, however, its interest in electric railway property not operated as part of its steam railroad system, in railroads operated in Quebec, Canada, and property sub-leased to the New York, Ontario & Western. The commission declined to approve the issuance by the new company of 257,870 shares of preferred stock, equal to 50 per cent of the number of shares of common stock authorized, and the applicants are authorized to proceed with their proposals only on condition that all provisions for the issue of preferred stock be excluded from the agreement. The report says that the steps now proposed are the initial steps toward further simplification of the organization of the properties. Commissioner Eastman dissented, saying that the new company, while assuming the funded debt, is to have practically none of the cash and similar resources built up by the D. & H.

DELAWARE, LACKAWANNA & WESTERN.—Bonds.—This company and the Morris & Essex have applied to the Interstate Commerce Commission for authority to sell \$15,000,000 of Morris & Essex 4½ per cent construction mortgage bonds at not less than 93½ and \$10,000,000 of similar 5 per cent bonds at 100½.

DENVER & SALT LAKE.—Trustees Sell 40 Per Cent of Stock.—George H. Burr, a New York banker and a director of this company, has acquired from the voting trustees 20,000 of the 50,000 shares of common stock of this company at a price reported to be \$150 a share.

ERIE.—Coal Properties.—This company has announced a plan for divesting itself of its principal anthracite properties. For this purpose the Pittston Company has been formed in Delaware. This company will lease the anthracite properties operated by the Pennsylvania Coal Company and the Hillside Coal & Iron Co., which are owned by the Erie. The Pittston Company is offering for sale 1,075,100 shares of no-par common stock of a total of 2,500,000 authorized shares to stockholders of the Erie at \$20 per share in the ratio of one share of the Pittston Company for each two shares of Erie stock of any class. Owners of large blocks of Erie stocks, including the Van Sweringen interests, have announced that they will take their pro rata share of stock in the new company. To provide enlarged outlets for its coal products the company has acquired control by stock purchase of the U. S. Distributing Corporation. This latter company, a holding company of companies engaged in the coal business, likewise controls one of the largest trucking organizations in the United States, i. e., the United States

Trucking Corporation in New York, which does trucking under contract for a number of railroads entering New York. The distributing company also controls a warehouse company and a company providing water transportation in New York harbor. The Van Sweringen interest by their control of the Pittston Company will likewise control the various other companies herein mentioned.

The Pittston Company has also acquired control of several other coal distributing companies in the New York metropolitan area.

NEW YORK CENTRAL.—Equipment Trust.—This company has applied to the Interstate Commerce Commission for authority to assume obligation and liability in respect of an issue of \$5,280,000 of equipment trust certificates of 1929 at 4½ per cent. The company will invite competitive bids.

Acquisition.—The Interstate Commerce Commission has authorized the New York Central to acquire joint control of the Sewell Valley, the Loop & Lookout and the Greenbrier & Eastern by purchase from the Chesapeake & Ohio of one-half the capital stocks of those companies and to assume obligation and liability jointly with the C. & O. in respect of the payment of principal and interest on \$300,000 of first mortgage 5 per cent bonds of the Sewell Valley.

NEW YORK CENTRAL.—Unification Plan.—The Interstate Commerce Commission has issued an order supplemental to that on the unification plan authorizing this company to pledge the capital stock of the Michigan Central, the Cleveland, Cincinnati, Chicago & St. Louis and the Chicago, Kalamazoo & Saginaw now held by it under its refunding and improvement mortgage.

NEW YORK, NEW HAVEN & HARTFORD.—Equipment Trust.—This company has applied to the Interstate Commerce Commission for authority for an issue of \$4,545,000 of 4½ per cent equipment trust certificates, to be offered for competitive bids.

NEW YORK, NEW HAVEN & HARTFORD.—Valuation.—Anent the final valuation of this company's property by the Interstate Commerce Commission, the company has issued the following statement:

The Interstate Commerce Commission has just issued its final valuation of the New Haven Railroad system as of June 30, 1915, placing the same at \$404,604,213. This valuation represents only the operated system owned and leased, at that time, including non-carrier physical property, and does not include the company's investment in steamship lines, other railroads (such as Boston & Maine, Ontario & Western, Rutland, etc.) electric, trolley and motor coach properties, or the New Haven's ownership in the valuable passenger terminals at New York and Boston. The company claims that the final valuation for the same property should be at least \$130,000,000 higher, even as of June 30, 1915, and being as of that earlier date, does not include the large amount of money which the company has spent on additions and betterments to its property since then. The Commission's findings of value are as of a date fourteen years ago and do not reflect present day conditions or values which the Supreme Court in its recent decision on the O'Fallon Case stated must be taken into consideration in finding values.

The final valuation reports recently issued by the Commission have generally stated that the discrepancy of the basic cost of reproduction upon 1914 level of prices would be removed when the final valuations reported were adjusted to later dates in accordance with the requirements of the Valuation Act.

No such statement appears to be made in the final valuation covering the New Haven although it shows that Commissioner Eastman dissents to the report for the same reasons as those indicated in the first paragraph of his dissenting opinion in the New York Central final valuation wherein he said: "the decision of the Supreme Court on May 20th, 1929 in *St. Louis & O'Fallon Railway Company vs. United States* makes it desirable I believe for us to review our methods of valuation and consider whether they are consistent in all respects with the views expressed by the Court."

The Interstate Commerce Commission's final valuation as of June 30th, 1915 for the New Haven Railroad System is \$404,604,213, of which \$309,894,585 represents owned property including the Harlem River & Port Chester Railroad, merged with the New Haven since valuation date, and \$94,709,628 leased property.

The Commission's final valuation exceeds the book investment less depreciation accrued on the books as of June 30th, 1915, in similar property, by \$43,364,823 for owned property, and \$39,995,040 additional for leased property.

These figures include non-carrier real estate and buildings, but do not include Steamship Lines, investments in other railroads such as Boston & Maine, Ontario & Western, Rutland, etc., electric, trolley and motor coach properties carried on the books of the New Haven at \$166,628,010; nor do they include the New Haven's ownership in the valuable passenger terminals at New York and Boston, amounting to over \$70,000,000, and the Central New England Railway which has been merged with the New Haven since valuation date.

As the Commission's figures are of a date over fourteen years ago, same must be brought down nearer to date to picture the situation as it exists today.

Including the Central New England Railway and adding net expenditures for additions and betterments, together with increase in cash and materials and supplies, from valuation date to November 30th, 1929, to the Commission's final valuation above stated gives a figure of \$414,220,012 for New York, New Haven & Hartford Railroad owned property and \$106,783,052 for leased line property.

This compares with investment in Road and Equipment adjusted for depreciation accrued on the books at valuation date to make same comparable with the Final Valuation, carried on the New Haven's books November 30th, 1929 of \$372,612,011 for owned property and \$70,192,729 for leased property which is carried on the books of the leased lines such as the Old Colony, Boston & Providence, Providence & Worcester, etc.

Valuation of the rail properties alone is not comparable with stock and outstanding bonds shown by the New Haven's balance sheet because part of such stocks and bonds were issued to acquire other properties or an interest in other properties whose valuation is not included in the foregoing figures.

The Steamship Lines and other railroad property are under Federal valuation while the trolley and electric properties are under separate valuation and the final values for any of these companies have not yet been ascertained.

Until the final valuations of all properties represented by the Investment are ascertained, it is impossible to say definitely just how the total book investment in these outside properties compares with the present value.

It is certain that the valuations of some of the properties will exceed the figure at which they are carried on the New Haven's books, while it is equally certain that others will fall below the book figures. However the officers of the New Haven feel certain that, based on present information, it may safely be said that the stock and indebtedness of the New Haven Company are more than supported by physical property embraced in the New Haven and the value of other properties in which it has investments.

ST. LOUIS - SOUTHWESTERN. — Bonds. — The Interstate Commerce Commission has authorized this company to procure the authentication and delivery of \$1,841,000 of its first terminal and unifying mortgage bonds to be delivered to its treasury in partial reimbursement of capital expenditures.

Average Prices of Stocks and of Bonds

| | Last Jan. 21 | Last week | Last year |
|--|--------------|-----------|-----------|
| Average price of 20 representative railway stocks. | 128.99 | 128.98 | 132.83 |
| Average price of 20 representative railway bonds. | 92.78 | 93.26 | 92.32 |

Dividends Declared

Buffalo, Rochester & Pittsburgh.—Common, 2 per cent; Preferred, 3 per cent, both payable February 15 to holders of record February 5.

Railway Officers

Executive

Effective December 30, 1929, the following officers of the Gulf, Mobile & Northern, will occupy similar positions with the New Orleans Great Northern: **P. E. Odell**, vice-president and general manager; **F. M. Hicks**, vice-president; **J. N. Flowers**, general solicitor, **R. E. DeNeefe**, comptroller; **H. E. Warren**, manager purchases and stores; **H. E. Ricker**, treasurer; **C. W. Peterson**, assistant comptroller; **C. J. Wade**, assistant comptroller; **E. A. Reynolds**, auditor of receipts; **F. N. Johnson**, auditor of disbursements; **J. S. Gibson**, auditor of capital expenditures; **H. S. Jones**, valuation engineer, and **D. A. Stewart**, freight claim agent, with headquarters at Mobile, Ala. **S. A. Robert** development director of the Gulf, Mobile & Northern will serve in the same capacity with the New Orleans Great Northern, with headquarters at Jackson, Miss. **W. E. Farris**, heretofore vice-president and general manager of the New Orleans Great Northern, will also act as vice-president of the Gulf, Mobile & Northern at New Orleans, La.

Charles J. Brister, assistant vice-president of the New York Central Lines, with headquarters at Chicago, has been appointed vice-president in charge of traffic of the New York Central and Pittsburgh & Lake Erie, with the same headquarters. **Loren F. Vosburgh**, traffic manager of the New York Central and Ohio Central Lines at New York, has been appointed vice-president in charge of passenger traffic of the New York Central and Pittsburgh & Lake Erie with the same headquarters. **Richard E. Dougherty**, engineering assistant to the president of the New York Central Lines, has been appointed vice-president in charge of improvements and development with headquarters, as before, in New York. **W. C. Bower**, manager of purchases and stores of the New York Central Lines, has been appointed vice-president in charge of purchases and stores with headquarters at New York. **William C. Wishart**, comptroller of the New York Central Lines at New York, has been appointed vice-president in charge of accounting, with the same headquarters. **LeRoy V. Porter**, assistant comptroller at New York, succeeds Mr. Wishart as comptroller, with the same headquarters. **William T. Stevenson**, traffic manager of the Cleveland, Cincinnati, Chicago & St. Louis at Cincinnati, Ohio, has been appointed assistant vice-president in charge of traffic, with headquarters at Chicago. All the appointments are effective February 1.

Operating

D. D. Seibert, assistant trainmaster on the Pittsburgh division of the Pennsylvania, has been promoted to trainmaster of the Toledo division.

D. L. Sommerville, division superintendent of the New York Central, with headquarters at Corning, N. Y., has been appointed assistant to general superintendent, second district.

M. J. Flanagan, assistant to the general manager of the Chicago, Milwaukee, St. Paul & Pacific, has been appointed manager of the safety department, with headquarters as before at Chicago.

S. A. Covington has been appointed superintendent of the Wichita Falls division of the Fort Worth & Denver City, with headquarters at Wichita Falls, Tex., and the position of general superintendent, formerly held by Mr. Covington, has been abolished.

J. E. Schneider, chief train dispatcher of the Louisiana and New Orleans Terminal divisions of the Illinois Central, has been promoted to trainmaster of the McComb district of the Louisiana division, with headquarters as before at McComb, Miss.

C. W. Nelson, assistant superintendent on the Atchison, Topeka & Santa Fe at Kansas City, Mo., has been promoted to superintendent of the Kansas City division, with headquarters at the same point, succeeding **H. M. Duncan**, deceased.

H. D. Barber, assistant superintendent of the Marion division of the Erie, with headquarters at Chicago, has been promoted to superintendent of the Meadville division, with headquarters at Meadville, Pa. **H. E. Wilson**, superintendent of the Allegany and Bradford divisions, with headquarters at Salamanca, N. Y., has been transferred to the Kent division with headquarters at Marion, O. **W. N. Sporleder** has been appointed assistant superintendent of the Marion division, with headquarters at Chicago, succeeding Mr. Barber. **T. J. Murphy**, trainmaster of the Susquehanna division, has been appointed superintendent of the Allegany and Bradford divisions, with headquarters at Salamanca.

Richard Cary Morse, general superintendent of the New York zone of the Pennsylvania, who also holds a similar position with the Long Island, has been appointed assistant general manager, New York zone, with headquarters at New York. Mr. Morse was born in Cleveland, O., on March 18, 1882. He is a graduate of the Sheffield Scientific School of Yale University, and entered railroad service on July 27, 1908, with the Pennsylvania as a yard clerk in Pitcairn yard, Pittsburgh division. He has held the positions of assistant yardmaster, assistant trainmaster, passenger trainmaster, superintendent of freight transportation at Philadelphia, division superintendent Philadelphia terminal division, general superintendent

of transportation at Chicago, and general superintendent at Buffalo, and in June, 1927, was appointed general superintendent, New York zone, which position he held until his recent appointment. From August, 1916, to June, 1919, Mr. Morse was furloughed for army service. He was appointed assistant chief of embarkation, commissioned major, and advanced to colonel in charge of the transportation of troops and freight for the American Expeditionary Force.

Hans Schantl, who has been promoted to superintendent of the Missouri-Illinois, with headquarters at Bonne Terre, Mo., has been connected with that road and the Mississippi River & Bonne Terre (which is now a part of the former company) for 16 years. He was born at Festus, Mo., on September 8, 1876, and after graduation from Washington University in 1903, entered railway service on August 31, 1906, as an assistant engineer on the M. R. & B. T. Eight years later he became chief clerk to the general manager and in 1916 he was advanced to purchasing agent and assistant engineer. On February 1, 1918, he was appointed assistant engineer of maintenance of way, then being promoted to engineer of maintenance of way on December 1. On February 1, 1921, Mr. Schantl was promoted to chief engineer of the Mississippi River & Bonne Terre, the Missouri-Illinois and the St. Francois County,



Hans Schantl

then being appointed division engineer of the Missouri-Illinois when that road and the Mississippi River & Bonne Terre were acquired by the Missouri Pacific on July 1, 1929. Mr. Schantl's promotion to superintendent of the Missouri-Illinois became effective on January 1.

H. E. McMullen, who has been promoted to superintendent of the El Paso-Amarillo division of the Chicago, Rock Island & Pacific, with headquarters at Dalhart, Tex., has been connected with the operating department of that railroad for 38 years. He was born at Casey, Iowa, on October 25, 1872, and entered railway service as a station helper on the Rock Island at that point in 1891. Later he was advanced to telegraph operator at Casey and in 1892

he was transferred to Stuart, Iowa. In 1893 Mr. McMullen was promoted to ticket clerk and dispatcher at Council Bluffs, Iowa, where he remained until 1895 when he became an operator and dispatcher at Des Moines, Iowa. After being transferred to the El Paso-Amarillo division in 1902 he was successively advanced to chief dispatcher at Dalhart and trainmaster at Bucklin, Kan.



H. E. McMullen

He also served as trainmaster at Pratt, Kan., and at Dalhart, then being promoted to assistant superintendent of the El Paso Amarillo division, with headquarters at Amarillo, Tex., in 1926. Mr. McMullen's further promotion to superintendent of that division became effective on January 1.

Financial, Legal and Accounting

Edward S. Hartwell, secretary and auditor of the Midland Terminal and auditor of the Manitou & Pikes Peak, with headquarters at Colorado Springs, Colo., has resigned and will make his home at Los Angeles, Cal.

F. D. Sanborn, assistant auditor of freight accounts of the Southern Pacific, has been promoted to auditor of freight accounts with headquarters as before at San Francisco, Cal., succeeding **F. W. Pope**, deceased. **P. H. Todd** has been appointed assistant auditor of freight accounts to succeed Mr. Sanborn.

Traffic

Millard G. Scovell has been appointed general agent of the Wichita Falls & Southern at Abilene, Tex.

J. C. Winfield, general freight agent of the St. Louis Southwestern, has been appointed assistant traffic manager, with headquarters as before at Tyler, Tex.

J. B. Payne, assistant general freight agent on the Chicago, Rock Island & Pacific, with headquarters at Des Moines, Ia., has been transferred to Chicago.

E. C. Pierre, chief clerk in the traffic department of the Atchison, Topeka &

Santa Fe at San Francisco, Cal., has been promoted to assistant general freight agent with headquarters at the same point.

Charles M. Andrews, assistant general freight agent of the Southern Pacific at Portland, Ore., has been appointed assistant general freight and passenger agent at Seattle, Wash. **Lester A. Brockwell**, district freight agent at Portland, has been promoted to assistant general freight agent at that point, succeeding Mr. Andrews.

John A. Lucey, traffic manager of the Minneapolis & St. Louis, has been promoted to chief traffic officer, with headquarters as before at Minneapolis, Minn., succeeding **E. E. Nash**, chief operating and traffic officer, who will devote all of his time to the duties of the former position. **B. F. Moffatt**, assistant freight traffic manager, with headquarters at Minneapolis, has been promoted to freight traffic manager, with headquarters at the same point.

J. B. McCorkle, general coal freight agent of the Pennsylvania at Pittsburgh, Pa., has been appointed coal traffic manager with the same headquarters, succeeding **Samuel A. Latimer**, deceased. **George R. Richardson**, chief of the freight traffic bureau, has been appointed assistant general freight agent at Philadelphia. **H. H. Gray**, division freight agent at Pittsburgh, has been appointed assistant general freight agent at the same point. **G. A. Hill**, division freight agent at Chicago, has been appointed assistant general freight agent at that point.

Traffic Appointments on C. N. R.

Following the appointment of Robert L. Burnap as vice-president in charge of traffic of the Canadian National, to succeed A. T. Weldon, retired, there have been a number of important changes in other positions in the Canadian National traffic department. Announcement of such changes, together with sketches and photographs of the officers appointed, are given herewith.

A. B. Chown, general passenger agent of the Canadian National-Grand Trunk, with headquarters at Chicago, has been appointed passenger traffic manager, with the same headquarters. **Walter Eastman**, assistant general passenger agent for the Grand Trunk Western Lines at Chicago, will succeed Mr. Chown as general passenger agent at that point.

Mr. Chown was born at Belleville, Ont., in 1887. He was educated in high school and Ontario Business College and entered railway service as ticket clerk for the Grand Trunk at Belleville in 1907. He served as soliciting passenger agent at Toronto from 1911 to 1913, then becoming traveling passenger agent for the same road at Pittsburgh, Pa. He served in the latter position until 1918, when he was transferred in the same capacity to New York. Later in the same year he was appointed acting general agent in the passenger department and in March, 1919,

he became general agent, passenger department, for the same road. He was appointed general agent in the passenger department of the Canadian National-Grand Trunk in 1920, and in December, 1921, he was promoted to the position



A. B. Chown

of assistant general passenger agent of the Grand Trunk at Chicago. He was advanced to the position of general passenger agent at the same point in 1923, the position he held at the time of his recent promotion.

Mr. Eastman was born in Hartland, Vt. He entered the service of the Central Vermont in 1917 as general passenger agent at Boston. The following year he became general passenger agent for the



Walter Eastman

Grand Trunk at the same point and in 1923 he was transferred to Chicago as assistant general passenger agent for the Grand Trunk Western Lines, the position he held at the time of his recent promotion to the position of general passenger agent.

R. W. Long, assistant freight traffic manager of the Canadian National with headquarters at Toronto, has been appointed general freight traffic manager, with headquarters at Montreal, succeeding D. O. Wood, who has retired.

Mr. Long was born on March 20, 1873, at Appin, Ont. He entered railway service on March 14, 1889, with the Grand Trunk at Buffalo, N. Y., and from that date until April 16, 1897, was subse-

quently telegraph operator, stenographer and clerk in various offices of the Grand Trunk at Buffalo. On the latter date he was appointed contracting freight agent for the same road at the same place. On September 16, 1901, he was appointed commercial agent, with the same headquarters, and on July 1, 1904, was appointed division freight agent at Stratford, Ont. On July 22, 1907, Mr. Long became division freight agent at Hamil-



R. W. Long

ton, Ont., and on June 1, 1919, was transferred in the same capacity to Toronto, Ont. On March 10, 1923, he was appointed general freight agent of the Central region of the Canadian National-Grand Trunk System (lines in the United States) at Montreal, Que. This position he occupied until the end of 1926, when he was appointed assistant freight traffic manager, which position he held until his present promotion.

D. O. Wood is retiring after a very lengthy railroad career. He was born in 1864 at Kleinburg, Ont., and entered the service of the Canadian National as clerk in the local freight office of the Grand Trunk at Toronto, Ont., in 1883. Between the years 1889 and 1897 he held the positions of rate clerk, claims clerk, chief clerk and district freight agent.



D. O. Wood

In the early years of the present century he was Ontario agent for the Robert Reford Company, and was associated with the Canadian Pacific. He became,

in March, 1919, traffic manager of the export and import department of the Canadian National at Toronto. In 1920 he was transferred to Montreal as general foreign freight agent and in 1923 became traffic manager of the foreign freight department. He was associated for two years with the British Ministry of Shipping. In 1926 Mr. Wood became general freight traffic manager of the Canadian National and in 1927 assistant foreign freight agent.

C. W. Johnston, assistant general passenger traffic manager of the Canadian National, with headquarters at Montreal, has been appointed general passenger traffic manager, with the same head-



C. W. Johnston

quarters. Mr. Johnston was born at Actonville, Que., in 1879, and was educated at St. Francis College, Richmond, Que. He entered railway service in 1895 as a clerk and telegraph operator for the Grand Trunk (now a part of the Canadian National), serving in that capacity until 1899. He then served as freight clerk at Berlin, N. H., and as telegraph operator and agent in the Portland district and at Sherbrooke, Que. Mr. Johnston then became clerk in the audit department at Montreal and subsequently ticket agent clerk, until he was appointed traveling agent in 1902. In 1906 and 1907 he served as an excursion clerk and during the latter year was appointed traveling passenger agent. He became chief clerk to the general passenger agent at Winnipeg, Man., in 1909, and then served in a similar capacity in the offices of the assistant passenger traffic manager and the passenger traffic manager. In 1914 Mr. Johnston was appointed assistant to the passenger traffic manager at Montreal, and in 1915 was advanced to assistant general passenger agent. In February, 1923, he was appointed passenger traffic manager, and in 1928 assistant general passenger traffic manager, which position he held until his recent appointment.

C. A. Skog, assistant general freight agent of the Grand Trunk Western lines of the Canadian National, with headquarters at Detroit, Mich., has been appointed general freight agent with the same headquarters. Mr. Skog commenced railway service in Winnipeg in 1912. In 1913 he was appointed chief clerk at Duluth, Minn., in 1916 commercial agent,

Minneapolis, Minn., in 1917 division freight and passenger agent, Duluth, Minn., and in 1927 assistant general



C. A. Skog

freight agent at Detroit, Mich., which position he held until his recent appointment.

D. M. Crawford succeeds Mr. Skog as assistant general freight agent, with headquarters at Detroit, Mich. J. V. Maloney has been appointed general agent with headquarters at Pittsburgh, Pa., and W. J. Hickey general agent with headquarters at Buffalo, N. Y. A. G. Gilmour, chief freight claim agent, with headquarters at Winnipeg, has been appointed auditor of freight claims, with headquarters at Montreal, replacing Edward Arnold, deceased. H. McDonald has been appointed chief freight claim agent at Winnipeg, with jurisdiction over the entire western region. T. Ginnelly has been appointed freight claim agent at Vancouver, C. F. Joyce assistant freight claim agent at Winnipeg, and J. W. Connell freight claim agent at Toronto.

Engineering, Maintenance of Way and Signaling

R. P. Habersham, resident engineer of the Spokane, Portland & Seattle, with headquarters at Portland, Ore., has retired from active duty after 34 years of continuous service with that company.

The titles of the division engineers of maintenance of way of the Chicago Great Western, G. Cottingham at Chicago, W. C. Groth at St. Paul, Minn., F. J. Hoffman at Clarion, Iowa, and F. U. Mayhew at Des Moines, Iowa, have been changed to division engineers.

H. T. Livingston, division engineer of the Arkansas-Louisiana division of the Chicago, Rock Island & Pacific at Little Rock, Ark., has been promoted to engineer of construction, with headquarters at Chicago. Fred P. Funda, office engineer in the maintenance of way department at El Reno, Okla., has been promoted to division engineer of the Arkansas-Louisiana division, succeeding Mr. Livingston.

G. B. Alexander, roadmaster of the Taber subdivision of the Lethbridge di-

vision of the Canadian Pacific, with headquarters at Lethbridge, Alta., has been promoted to division engineer of the Revelstoke division with headquarters at Revelstoke, B. C. K. A. Dunphy, division engineer of the Brandon division, with headquarters at Brandon, Man., has been transferred to the Kenora division, with headquarters at Fort William, Ont., succeeding D. C. Chisholm, who has been transferred to another section of the same division, with headquarters at Kenora, Ont. Mr. Chisholm replaces S. C. Wilcox, who has been transferred to the Brandon division to succeed Mr. Dunphy.

Harold S. Ashley, assistant engineer of the Boston & Maine with headquarters at Dover, N. H., has been appointed assistant division engineer, Fitchburg division, with headquarters at Fitchburg, Mass., to succeed Henry C. Archibald, who has been promoted to division engineer, Connecticut River division with headquarters at Springfield, Mass. Mr. Archibald will succeed Frank E. Sampson, who has been appointed assistant engineer, reporting to the engineer maintenance of way, with headquarters at Boston, Mass. John F. Spain has been appointed supervising cost engineer, reporting to the engineer maintenance of way, with headquarters at Boston.

Charles D. Purdon, consulting and valuation engineer of the St. Louis Southwestern system, with headquarters at St. Louis, Mo., retired from active duty on January 1, after 56 years of railway service, nearly 20 of which have been with the Cotton Belt. Mr. Purdon was born at Belfast, Ireland, on October 6, 1850, and after attending a private school and Queen's University, entered railway service on May 1, 1870, as an axman on the Intercolonial (now part of the Canadian National). With this road he was promoted to assistant engineer and then for four years he was engaged as an assistant engineer in the public works department of Canada on surveys of the St. Lawrence river and as a county surveyor in Texas, then returning to railroad service in 1880 as an assistant engineer on the Texas & St. Louis (now part of the Cotton Belt). For the following 30 years, Mr. Purdon served successively as locating engineer of the T. & St. L. in charge of the construction of the bridge over the Arkansas river at Robroy, Ark., resident engineer on the construction of the Coal Hill branch, and transfer incline of the Little Rock & Fort Smith (now part of the Missouri Pacific) at Arkansas City, Ark., assistant engineer on the St. Louis-San Francisco in charge of the construction of the Arkansas river bridge at Van Buren, Ark., and the Red river bridge at Arthur City, Tex., and assistant chief engineer in charge of branch line construction, resident and division engineer on the Louisville & Nashville, bridge engineer, resident engineer, principal assistant engineer and assistant chief engineer of the Atchison, Topeka & Santa Fe, chief engineer of the Kansas City Belt (now part of the Kansas

City Terminal), chief engineer, engineer, of maintenance of way and consulting engineer of the Frisco, chief engineer of the Memphis Terminal (now part of the Illinois Central), and assistant engineer of the Missouri Pacific on valuation of



Charles D. Purdon

the Nebraska lines and grade separation at St. Louis. In 1910 Mr. Purdon was appointed chief engineer of the Cotton Belt, then becoming consulting and valuation engineer in 1918.

Vincent H. Doyle, who has been appointed valuation engineer of the Pere Marquette, with headquarters at Detroit, Mich., has been connected with the Chesapeake & Ohio and the Hocking Valley for eight years. He entered railway service in 1908 as a rodman on the Hocking Valley and then served in various capacities in the engineering department until 1914, when he was ad-



V. H. Doyle

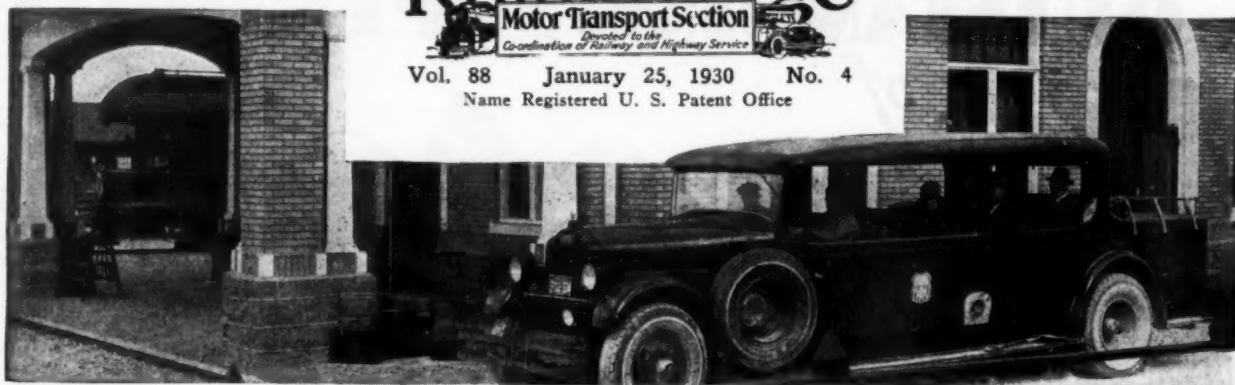
vanced to assistant division engineer. From the latter part of 1914 until 1917 Mr. Doyle was appraisal engineer of the Ohio Public Utilities Commission, then returning to the Hocking Valley as assistant engineer and chief land appraiser in the valuation department. During the World War he served as a first lieutenant of field artillery. In 1927 Mr. Doyle was appointed terminal land appraiser of the Chesapeake & Ohio, later being promoted to office engineer of the valuation department, a position he held until his appointment as valuation engineer of the Pere Marquette.

Railway Age

Motor Transport Section

Devoted to the
Coordination of Railway and Highway Service

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TYPICAL RECORDS DENOTING *the* OUTSTANDING SUPERIORITY *of* **Firestone** **GUM-DIPPED** **TRUCK & BUS BALLOON**

That Firestone Gum-Dipped Truck and Bus Balloon Tires out-run, out-wear and out-perform any other tires on the market today is clearly indicated by the following typical records, selected at random from the hundreds of owners' statements in our files.

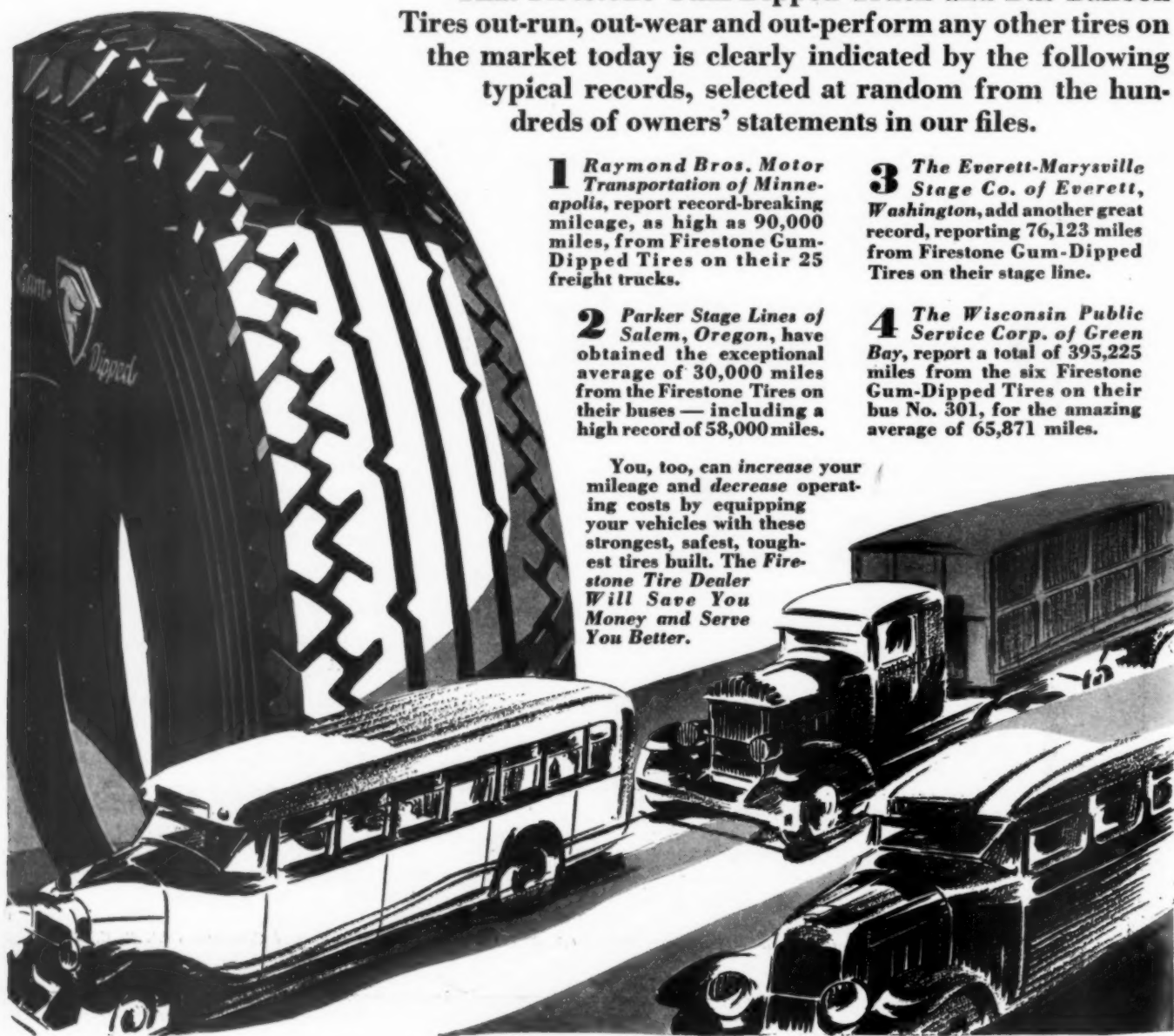
1 *Raymond Bros. Motor Transportation of Minneapolis, report record-breaking mileage, as high as 90,000 miles, from Firestone Gum-Dipped Tires on their 25 freight trucks.*

3 *The Everett-Marysville Stage Co. of Everett, Washington, add another great record, reporting 76,123 miles from Firestone Gum-Dipped Tires on their stage line.*

2 *Parker Stage Lines of Salem, Oregon, have obtained the exceptional average of 30,000 miles from the Firestone Tires on their buses — including a high record of 58,000 miles.*

4 *The Wisconsin Public Service Corp. of Green Bay, report a total of 395,225 miles from the six Firestone Gum-Dipped Tires on their bus No. 301, for the amazing average of 65,871 miles.*

You, too, can increase your mileage and decrease operating costs by equipping your vehicles with these strongest, safest, toughest tires built. The Firestone Tire Dealer Will Save You Money and Serve You Better.



The Interstate Regulation Situation

WITH a persistence which augurs success, the advocates of regulation for interstate motor coach operation are pressing for the passage of the necessary legislation by Congress. The House Committee on Interstate and Foreign Commerce held a hearing on the current Parker bill, H. R. 7954, on January 8 and 9, at which a strong case in favor of the passage of the legislation by Congress was presented by representatives of the various interests advocating it. Naturally, there was some opposing testimony, which in general developed the familiar theme that regulation would curtail and perhaps stifle the development of motor coach transportation.

On the other hand, representatives of the National Automobile Chamber of Commerce, the National Association of Railroad and Utilities Commissioners, important independent motor coach lines, and spokesmen for the Association of Railway Executives, and the American Electric Railway Association, presented a united front in support of the Parker bill, and strongly urged its passage. It is fortunate for the chances of the pending regulatory legislation that these organizations have reconciled their differences of viewpoint and opinion and have taken a compromise position which they can all support. Naturally, selfish interests have more or less of an influence on conviction: Some of the railways themselves now look upon the regulation of interstate motor coach lines from a somewhat different standpoint than that which they adhered to a year or so ago.

However, such differences of opinion as have existed among the advocates of interstate regulation of motor coaches have been as to details in the regulatory plan, and have not involved the principle of regulation. This principle has for some time been strongly supported by those who would be most affected.

Inequality in Regulatory Situation

The inequality of a situation where an intrastate motor coach line is subject to regulation, while an interstate line of the same character is subject to no regulation whatever, must be obvious. This situation has

been prejudicial to the interests of the intrastate lines, has encouraged the establishment of interstate lines beyond all justification by public convenience and need, and has encouraged evasions of existing state laws governing intrastate operations. It is difficult to see how the regulation of the interstate lines would stifle the development of motor coach transportation, because such transportation has enjoyed a normal and healthy growth within the states under existing state regulations.

The pending Parker bill provides for sufficient regulation of the interstate motor coach lines, but not too much. Rather, its provisions would seem to promise a form of regulation which would correct the bad situation which has persisted under intrastate regulation and interstate non-regulation, while leaving the way open for the development of motor coach transportation along sane and reasonable lines.

Proposal to Bond Lines

Some of the members of the Committee on Interstate and Foreign Commerce of the House of Representatives believe that sufficient regulation of the interstate lines would be provided if they were required merely to give bond to insure the protection of their passengers and employees. Such at least was the tenor of the questions which they put to witnesses appearing at the recent hearing.

Two bills to this effect, as a matter of fact, have already been introduced in Congress. It would seem, however, that the establishment of "regulation" of this kind would be even less than a half-way measure. While it might discourage "fly-by-night" interstate operations, which are constantly becoming fewer, it would by no means meet the real need for interstate regulation. It would have no effect on the continued establishment of wholly unnecessary interstate lines, would not correct the inequalities which exist in the restrictions placed upon intrastate and interstate lines, and, by failing to discourage them would encourage continued evasion of state laws by the unscrupulous among interstate operators.

There is reason for hope that the present Parker bill will be passed at this session of Congress. Possibly the press of other legislation will prevent action upon it; but it is more likely that, if the bill should fail of attention and passage, it will be because of a lack of public interest in this legislation. For this reason, it may be advisable for those favoring the passage of the present Parker bill to exert all possible efforts to inform the public of the reasons and need for regulation of the interstate lines. It might be difficult to arouse much public sentiment in this direction—it must be admitted that the opponents of regulatory legislation are in a position to advance arguments which would be more likely to arouse public attention—but the advocates of interstate regulation might be able to make sufficient headway to persuade Congress to give the bill its attention. When that happens, it is likely that regulation of interstate motor coach lines will become a fact, and not a goal which has appeared distant for several years.

Is Railway Motor Coach Operation Illegal?

THE Pickwick-Greyhound Lines, Inc., that part of the nation-wide Greyhound motor coach system which operates lines west of Chicago and St. Louis, Mo., to the Pacific coast, has filed a complaint with the Interstate Commerce Commission, alleging that the Union Pacific, through its purchase and operation of the Interstate Transit Lines, a motor coach operating company, has violated certain clauses of the Interstate Commerce Act and the Transportation Act, 1920. The alleged acts and methods of the Union Pacific and the Interstate Transit Lines complained against are published on other pages of this issue, together with the paragraphs and sections of the Interstate Commerce Act which the railway is charged with violating.

The Union Pacific acquired the Interstate Transit Lines about six months ago, and through this company and other motor coach operating subsidiaries in the west, has established motor coach lines operating from Chicago and St. Louis, to Los Angeles, Cal., and Portland, Ore. These lines in general parallel the railway lines of the Union Pacific, and constitute an outstanding addition to the motor coach operations of the railways. Most of the incidents in connection with the purchase of the Interstate Transit Lines by the Union Pacific, and the present methods of operation of the motor coach line, are believed to be common to similar incidents and methods involved in the purchase and operation of other motor coach lines by other steam railways.

There is reason to believe, therefore, that if the Union Pacific should be proved to be violating the Interstate Commerce Act, other railways operating motor coaches

might similarly be proved to have violated the law. For this reason, the present complaint is of interest, not alone to the Union Pacific, but to all of the many railways operating motor coaches through subsidiary companies.

It is possible that the action of the Pickwick-Greyhound Lines is merely a gesture designed to influence state commissions in their action upon applications for intrastate motor coach operating certificates which have been filed by the Interstate Transit Lines and which, in most if not all cases, are being opposed before the state commissions by the Pickwick-Greyhound Lines. However, counsel for the latter lines have announced their intention of making a test case of this complaint, so that there would appear from this announcement to be justification for the belief that it will be pressed as strongly as possible.

Charges somewhat similar to those made against the Union Pacific by the Pickwick-Greyhound Lines were made against the Spokane, Portland & Seattle a little more than a year ago, by an independent motor coach operator in the Pacific northwest. The commission in that case ruled that the complaints made had not been supported by the testimony in the case. In view of this precedent, it is considered possible, if not probable, that the commission will take similar action on the present complaint. However, the complaint has been docketed by the commission, and the case gives promise of being one of considerable interest to many railways.

Railway Motor Transport Developments in 1929

AMONG the steam railways, there was more activity along motor transport lines in 1929 than in any previous year. The year marked the virtual passage of experimental motor coach operation by steam railways, nearly all of the highway lines established having been parts of programs for operation on a system basis. One of the most significant trends in the year was the purchase of many independent motor coach lines by the steam railways. Truck operations by steam railways likewise expanded, the most interesting development having been the establishment of store-door collection and delivery service by several roads.

Among the outstanding events of the year were the purchase by the Pennsylvania, the Great Northern and the Southern Pacific of substantial interests in the Motor Transit Corporation, holding company for the transcontinental motor coach system operated by the Greyhound, Pickwick, California Transit, Yelloway, and other lines; the establishment by the Missouri Pacific of more than 4,000 miles of motor coach routes; the establishment of motor coach and motor truck

routes by the St. Louis Southwestern, the mileage of which is not much less than its railway mileage; the purchase by the Union Pacific of a number of independent lines, and its subsequent establishment of trans-continental motor coach service from Chicago and St. Louis, Mo., to the Pacific coast; the establishment of store-door collection and delivery service on certain of the lines of the Southern Pacific, the Texas & Pacific, and the Cotton Belt, and the embarkation of the New Haven on a program of truck operation which is showing signs of rivaling in scope its extensive motor coach services.

According to reports to the *Railway Age*, the railways last year purchased 390 motor coaches, 1,764 trucks, 59 tractors, and 31 trailers, these purchases having been substantially in excess of those in 1928. According to the best statistics available, at the close of 1929, 78 railways were operating 2,389 motor coaches, while 55 railways were operating in the neighborhood of 5,900 motor trucks, tractors and trailers. There is every indication that motor transport developments among the steam railways in 1930 will overshadow even those in 1929, which in all respects was a record year from the standpoint of progress in the co-ordination of railway and highway service.

The Express Agency and Railway Truck Service

THE possibility that the Railway Express Agency has the facilities and organization which would make it a logical operator of motor trucks under contracts with the railways, by means of which they might replace to some extent or extend their present railway freight services, has been under intensive discussion for some months. This possibility was suggested at the recent meeting of the Motor Transport Division in Toronto.

The Railway Express Agency is already one of the largest operators of motor trucks in the United States. Perhaps it is now the largest operator of motor trucks; certainly it is in not lower than second place. The Railway Express Agency is owned by the railways. Its fleet of motor truck equipment, numbered in the thousands, is spread all over the United States. Similarly, its organization is on a nation-wide basis, as is its experience in motor truck operation. Experienced in operating motor trucks on a large scale the Railway Express Agency should find it easily possible to extend its facilities and organization to the extent necessary to enable it to perform motor truck service under contracts with the railways.

With the thought that railway officers may not be familiar with the organization, facilities and methods of the Railway Express Agency in operating a fleet of

thousands of motor trucks, there is presented in this issue an article describing some of the outstanding features of this operation. This operation of a company owned by the railways is one of the foremost examples of highly developed motor transportation in the United States.

Motor truck operation by or on behalf of the railways in connection with their freight transportation work is a subject of much interest at this time. The favorable results secured by a number of railways, which have been using motor trucks for several years in the replacement or extension of their railway freight services, have become rather generally known, and it is probably not too much to say that many more railways are now studying ways and means whereby they may secure similar good results through the use of freight-carrying motor vehicles.

In the contemplation of such a co-ordinating plan, full consideration of the possible opportunity existing in the organization and facilities of the Railway Express Agency is merited.

Co-operative Operation of Motor Coach Routes

THERE are almost countless places in the United States where two or more steam railways connect important cities between which there is competitive and frequently successful independent motor coach service. Frequently in such instances, at least one, and perhaps more, of the railways have desired to put on their own motor coaches between these points, to compete with the independent highway carrier on his own ground, and to supplement the existing railway service. Is it not better for the railways to co-operate in meeting conditions of this kind, by establishing a joint motor coach service, than for each road to act individually? Is it not better particularly when the available traffic between the two points is insufficient to support the available motor coach service?

Co-operative action by railways in the establishment of motor coach lines between competitive points has been widely suggested and in one or two instances has been tried. An experiment with it is being made this winter by the Pennsylvania and the Reading, both of which have motor coach service between Philadelphia, Pa., and Atlantic City, N. J. It remains to be seen how these experiments work out, but there is reason to believe that the results will be much more favorable than they would have been if each railway had continued to compete actively with the other.

The experiments in co-operative operation of motor coach lines between competitive points will be closely watched. It is quite possible that this method of operation is adaptable elsewhere.

Our Largest Truck Operator—

The Express Agency

*Railroads own company operating 8,941 motor vehicles
located in every state—Suggest possibility of
expansion to handle freight for railways*

AT THE recent meeting of the Motor Transport Division at Toronto, Ont., the suggestion was made that the Railway Express Agency, which is owned by the railways of the United States, might expand its facilities in the direction of motor truck operation for the transportation of freight on behalf of the railroads and in co-ordination with their train service. It was pointed out that the Express Agency is already a nation-wide organization, experienced in motor truck operation and so organized as to enable it to engage in motor truck operation for freight traffic in virtually any part of the country by some expansion of its already existing organization and facilities.

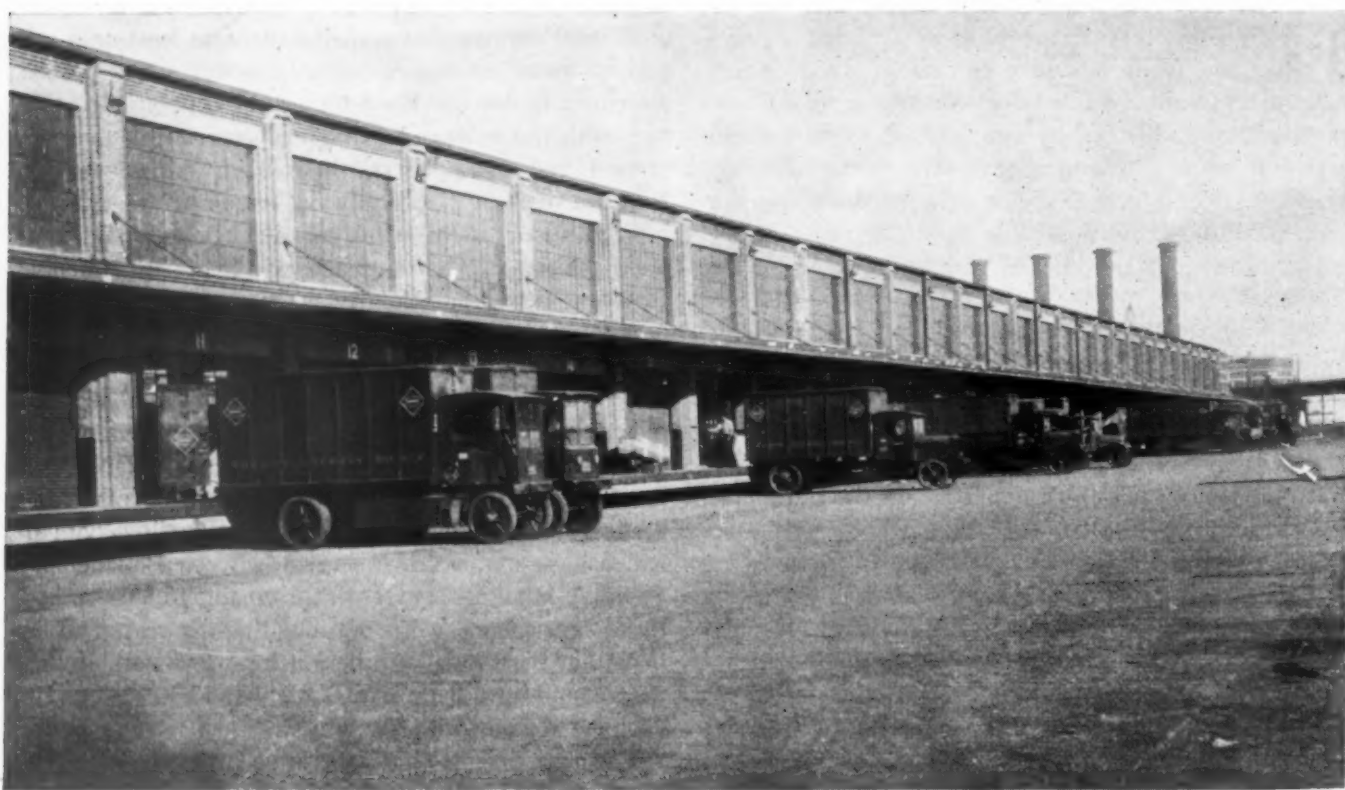
A number of railways now have contracts with independent trucking companies which engage in the transportation of freight by motor truck for the railways in a number of terminals and over various lines, in replacement of several kinds of freight train service. It was pointed out at the Motor Transport Division meeting that the Railway Express Agency might perform similar services for them to their advantage.

In view of this suggestion, a description of the organ-

ization, facilities, and operating methods of the Railway Express Agency, with respect to its motor vehicle operations, may be of interest.

The Railway Express Agency is one of the two largest, if not actually the largest, operators of motor trucks. Its truck operating organization is nation-wide. The operations of the company are carried on under five general departments, each in charge of a vice-president, as follows: Eastern department, C. W. Robie; central department, E. A. Stedman; southwestern department, C. D. Summy; southern department, W. G. Smith; and western department, L. O. Head. The operation of motor vehicles in each division is supervised by a superintendent of motor vehicles to whom the superintendents of motor vehicles report.

The maintenance of all automotive equipment, and purchases in connection therewith, is under the jurisdiction of the department of maintenance and purchases, of which E. E. Bush is manager, and E. E. La Schum is general superintendent. Mr. La Schum is also general superintendent of motor vehicles, in reality the automotive engineer of the company, having charge of



New York City Express Terminal on the New York, New Haven & Hartford



Location of Motor Vehicle Equipment of the Railway Express Agency

maintenance of all automotive equipment over the country as a whole.

Equipment Owned

The motor vehicle equipment owned by the Railway Express Agency is numbered in the thousands. On December 1, 1929, the agency owned 6,791 gasoline motor trucks, 1,521 electric trucks, 171 gasoline tractors,

in the motor vehicle equipment of the agency during the past 10 years.

The motor vehicle equipment of the Railway Express Agency is distributed over all of the 48 states, as well as the District of Columbia. Gasoline trucks of

Table I—Highway Vehicles (except passenger cars)
Owned by Railway Express Agency

| | Gas. Trucks | Tractors | Elec. Trucks | Trailers | Total |
|--------------|-------------|----------|--------------|----------|-------|
| Jan. 1, 1919 | 1,928 | 1 | 1,004 | 1 | 2,934 |
| " 1920 | 1,930 | 1 | 1,010 | 1 | 2,942 |
| " 1921 | 1,979 | 3 | 1,038 | 15 | 3,035 |
| " 1922 | 2,080 | 13 | 1,071 | 30 | 3,194 |
| " 1923 | 2,533 | 32 | 1,215 | 89 | 3,869 |
| " 1924 | 3,207 | 50 | 1,426 | 151 | 4,834 |
| " 1925 | 3,651 | 52 | 1,520 | 179 | 5,402 |
| " 1926 | 3,872 | 98 | 1,548 | 248 | 5,766 |
| " 1927 | 4,184 | 112 | 1,553 | 324 | 6,173 |
| " 1928 | 4,638 | 139 | 1,607 | 371 | 6,755 |
| " 1929 | 5,764 | 149 | 1,590 | 402 | 7,905 |
| Dec. 1, 1929 | 6,791 | 171 | 1,531 | 448 | 8,941 |

10 electric tractors, and 448 trailers, making a total of 8,941 motor vehicles in operation. The agency also operates some horse-drawn equipment, but this is being replaced as rapidly as possible by motor equipment. For example, during 1929 the agency purchased 1560 motor vehicles, including 1070 1-ton trucks, 13 1½-ton trucks, 163 2-ton trucks, 76 2½-ton trucks, 129 3½-ton trucks, 9 5-ton trucks, one 1-ton tractor, 42 5-ton tractors—all gasoline,—and 35 2-ton electric trucks, and 22 3½-ton electric trucks.

The accompanying tabular summary shows the growth in the motor vehicle fleet of the express agency. On January 1, 1919, the company had 1,928 gasoline trucks, one gasoline tractor, 1,004 electric trucks, and one trailer, a total of 2,934 pieces of equipment. The present fleet of 8,941 vehicles, including 6,791 gasoline trucks, 171 tractors, 1,531 electric trucks and tractors, and 448 trailers, represents an increase of 200 per cent

Table II—Distribution of Equipment

| States | Trucks | States | Trucks |
|----------------------|--------|----------------|--------|
| Alabama | 65 | Nebraska | 90 |
| Arizona | 23 | Nevada | 9 |
| Arkansas | 74 | New Hampshire | 36 |
| California | 480 | New Jersey | 367 |
| Colorado | 91 | New Mexico | 11 |
| Connecticut | 161 | North Carolina | 77 |
| Delaware | 1 | North Dakota | 19 |
| District of Columbia | 75 | New York | 1,352 |
| Florida | 146 | Ohio | 600 |
| Georgia | 132 | Oklahoma | 136 |
| Idaho | 17 | Oregon | 61 |
| Illinois | 684 | Pennsylvania | 620 |
| Indiana | 230 | Rhode Island | 56 |
| Iowa | 165 | South Carolina | 37 |
| Kansas | 127 | South Dakota | 27 |
| Kentucky | 94 | Tennessee | 103 |
| Louisiana | 96 | Texas | 323 |
| Maine | 32 | Utah | 36 |
| Maryland | 62 | Vermont | 17 |
| Massachusetts | 579 | Virginia | 105 |
| Michigan | 342 | Washington | 82 |
| Minnesota | 101 | West Virginia | 59 |
| Mississippi | 53 | Wisconsin | 178 |
| Missouri | 278 | Wyoming | 11 |
| Montana | 40 | | |

1½-ton capacity are the most common, there being 4,064 of these, while the next largest number is in the 2½-ton size, there being 1,793 in this classification. Table II, distribution of equipment, shows the number of motor vehicles and their sizes, in each of the states and in the District of Columbia.

It will be noticed that in California, there are two 1-ton tractors, 320 1½-ton trucks, 109 2½-ton trucks, two 3½-ton trucks, 7 5-ton tractors, two 2-ton electric trucks, 19 3½-ton electric trucks, 5-ton electric trucks and 10 5-ton electric tractors. In Illinois, there are 223 1½-ton trucks, 102 2½-ton trucks, 141 3½-ton trucks, 15 5-ton trucks, 64 5-ton tractors, 57 2-ton elec-



Three and One-Half Ton Truck Used for Transfer Service

tric trucks, 61 $3\frac{1}{2}$ -ton electric trucks, and 21 5-ton electric trucks.

In Massachusetts, there are 330 $1\frac{1}{2}$ -ton trucks, 62 $2\frac{1}{2}$ -ton trucks, 14 5-ton trucks, 43 $3\frac{1}{2}$ -ton trucks, 7 5-ton tractors, 20 2-ton electric trucks, 85 $3\frac{1}{2}$ -ton electric trucks, and 18 5-ton electric trucks. In New York are 287 $1\frac{1}{2}$ -ton trucks, 183 $2\frac{1}{2}$ -ton trucks, 286 $3\frac{1}{2}$ -ton trucks, 5 5-ton trucks, 44 5-ton tractors, 294 2-ton electric trucks, 140 $3\frac{1}{2}$ -ton electric trucks, and 113 5-ton electric trucks. In Ohio are 4 1-ton tractors, 277 $1\frac{1}{2}$ -ton trucks, 157 $2\frac{1}{2}$ -ton trucks, 71 $3\frac{1}{2}$ -ton trucks, 12 5-ton trucks, 16 5-ton tractors, 52 2-ton electric trucks, and 11 $3\frac{1}{2}$ -ton electric trucks. In Pennsylvania, there are 197 $1\frac{1}{2}$ -ton trucks, 139 $2\frac{1}{2}$ -ton trucks, 98 $3\frac{1}{2}$ -ton trucks, 6 5-ton trucks, 6 5-ton tractors, 158 2-ton electric trucks, 11 $3\frac{1}{2}$ -ton electric trucks, and 5 5-ton electric trucks. This indicates the wide distribution of the express agency's motor equipment.

Nor is it concentrated at a few points in each state. On the contrary the equipment is distributed widely over each state; in fact, motor vehicle equipment of the Railway Express Agency is now operating in nearly 1,750 cities and towns in the United States. Trucks of the Railway Express Agency are located, for example, at 17 points in Alabama, 29 points in Arkansas, 74 points in California, 25 points in Connecticut, and 20 points in Minnesota. This nation-wide distribution of equipment, with its attendant nation-wide experience



One and One-Half Ton Truck Used for Pick-up and Delivery Service

in motor truck operation, together with the nation-wide organization necessary to operate this equipment, are considered strong factors in favor of the Railway Express Agency as an operator of motor vehicles for the railways in connection with their freight transportation services.

Operating Organization

Motor vehicle equipment owned by the Railway Express Agency is in the active charge of a superintendent of motor vehicles located in each division headquarters' office.

Superintendents of motor vehicles are located at New York, Buffalo, N. Y., Boston, Mass., and Philadelphia, Pa., in the eastern department; at Chicago, Cleveland, Ohio, Cincinnati, Omaha, Neb., and St. Paul, Minn., in the central department; at St. Louis, Mo., Kansas City, and Houston, Tex., in the southwestern department; at Atlanta, Ga., and Washington, D. C., in the southern department, and at San Francisco, Cal., Seattle, Wash., and Los Angeles, Cal., in the western department. The superintendents are responsible for the hiring and training of drivers and for the routing and loading of the vehicles in their



Two-Ton Truck With Standard Enclosed Body

territories. In the larger cities, these duties may be divided between a supervisor of street service, who has charge of door-to-door pick-up and delivery, and a supervisor of terminal service, who is in charge of railroad and steamship terminal transfer work. In the smaller cities and towns, a city manager, general agent or agent, depending on the size of the municipality, has supervision over the local truck operations.

In the larger cities, where stops are frequent, a driver and one or more helpers are placed on each truck used in pick-up and delivery service, but in the small towns only one man is assigned to each truck. In either case the policy of delivery in the morning and pick-up in the afternoon is in effect, although this may necessitate a return to the local express office several times during the day. One and two-ton trucks predominate for pick-up and delivery service. Where the traffic is unusually heavy, a $3\frac{1}{2}$ -ton truck may be used for pick-up and delivery service, but this equipment is operated only where it can be used also during the night for terminal transfer work. Frequently the loading platform driveway is used as an open air garage and the night shift drivers continue the work of the day force by unloading the afternoon pick-up and using the truck for transfer work the balance of the night. Where transfer work can be carried on in the day time and

the volume of traffic warrants it, tractors and trailers are used, one tractor handling several trailers, moving one while the rest are being loaded or unloaded. The volume of traffic moved in this manner is indicated by the fact that the company owns 171 tractors and 448 trailers.

Maintenance Policies

As stated before, maintenance of the motor vehicles of the Express Agency is under the supervision of the general superintendent of motor vehicles located at New York. The maintenance policy of the motor vehicle department has been carefully developed since the reorganization and combination of the express companies in 1918, with the result that methods are standardized and consistently followed by all of the divisional motor vehicle departments. The field forces are in close contact with the general superintendent's office at all times. Meetings of the department superintendents are held for the purpose of discussion of the maintenance policy and its application in each section of the country, and to talk over the operating difficulties ex-



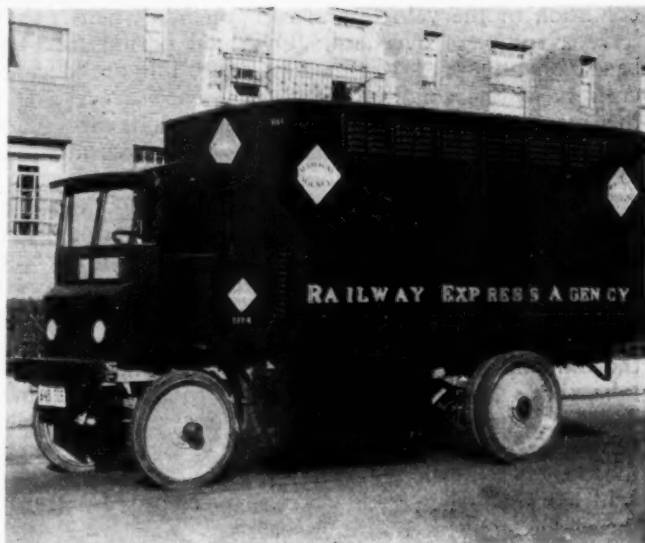
Trailers Are Used for Terminal Transfer Service

perienced by each superintendent. The general superintendent makes a personal inspection of each large center of operation at least once a year. Service data covering changes in design and alterations in construction found necessary by operating experience are issued by the general office and sent to each subdivision.

A uniform method of arranging and writing up stock room inventories is in effect in all departments, and copies of inventory sheets are exchanged between the superintendents for the purpose of using up any surplus stock. The same system of numbering parts is in effect in all stock rooms so that one stock room clerk knows what any other stock room has on hand by reference to the inventory sheet. This method facilitates the reduction of slow moving inventories.

Standardization of Parts

In the study to reduce inventories, it was found that a large number of parts were interchangeable and that



Two-Ton Electric Truck with Ventilated Body

the same part could be used on several trucks. This applied particularly to bolts and screws and to certain other parts such as bushings and steering knuckle pins. Stock room reference sheets are now cross-indexed to take advantage of this interchangeability. Manufacturers do not give any discount for purchase of parts in quantity and, as it was found necessary to order a large number of similar parts which were probably used on one or more makes of vehicles, blue prints with all working dimensions were made and given out for bids. This was found to result in a remarkable saving as compared with buying the parts on a single piece basis.

Bodies are standardized and parts lists have been developed indicating where hardware and standard parts can be obtained. This reduces the amount of blacksmith and hand fitting work required and results in a stronger and lighter body.

In the larger cities, a garage force is maintained to make running repairs and to interchange units when necessary, but in the small towns an arrangement is made with local repair shops to do this work. By this means, every vehicle is regularly washed, greased and serviced.

Another important maintenance feature is the periodic inspection of every vehicle, which is made by a traveling inspector who notes the exact mechanical



One and One-Half Ton Truck with Dual Tires on Rear

condition of the vehicle and recommends when it shall have a complete overhaul. Overhaul periods are not based on any predetermined mileage, but are decided entirely by the condition of the vehicle as revealed by the inspectors' reports. These inspections are made at least every two months and enable the superintendent to know the exact condition of each vehicle.

An experiment along this line is being conducted at the present time whereby the inspector is given a new one-ton standard express truck, together with a few extra parts such as cylinder head gaskets, valves, fan belts and brake lining. The inspector gives the local driver his new truck and proceeds to make repairs to the old one. When they are completed, the inspector takes back his truck and proceeds to the next town. This is expected to eliminate the necessity of having running repairs made by local shops, and should keep the vehicles in better condition. No matter where vehicles are located, they are inspected regularly by the superintendent or his assistants.

Motor vehicle repair shops, equipped to do heavy work and keep a stock of replacement parts are located at New York, Boston, Chicago, Buffalo, Cleveland, San Francisco, Atlanta, St. Louis, Philadelphia, Pittsburgh, Los Angeles, Portland and Seattle.

These shops keep a supply of parts and of repaired units available for the vehicles operated in the district which they serve. In the motor vehicle repair shops, the work is often split up between a garage foreman, who supervises the movement of vehicles in and out of the building, makes running repairs and looks after gassing, oiling, washing and greasing, and a shop foreman who deals entirely with major repairs and the maintenance of the stock room. It is a policy of the company to keep vehicles of the same make in service in each district. This reduces the stock of parts necessary and helps prevent service delays, and has resulted in reducing the total parts inventory to one seventh of its previous value.

Repaired units for each make of vehicle in regular

use in the district are kept on hand. If a replacement is necessary, the local inspector calls on the nearest stock room, and the unit is forwarded by the company's railroad cars, not infrequently arriving before the old unit has been removed from the chassis. The old unit is then sent to the shop and repaired. This unit replacement system is an important feature of the maintenance policy, and is the only method whereby a truck located a considerable distance from a repair shop can be kept in service. A system of numbering these units is carried out constantly in all departments to prevent ordering the wrong size or model.

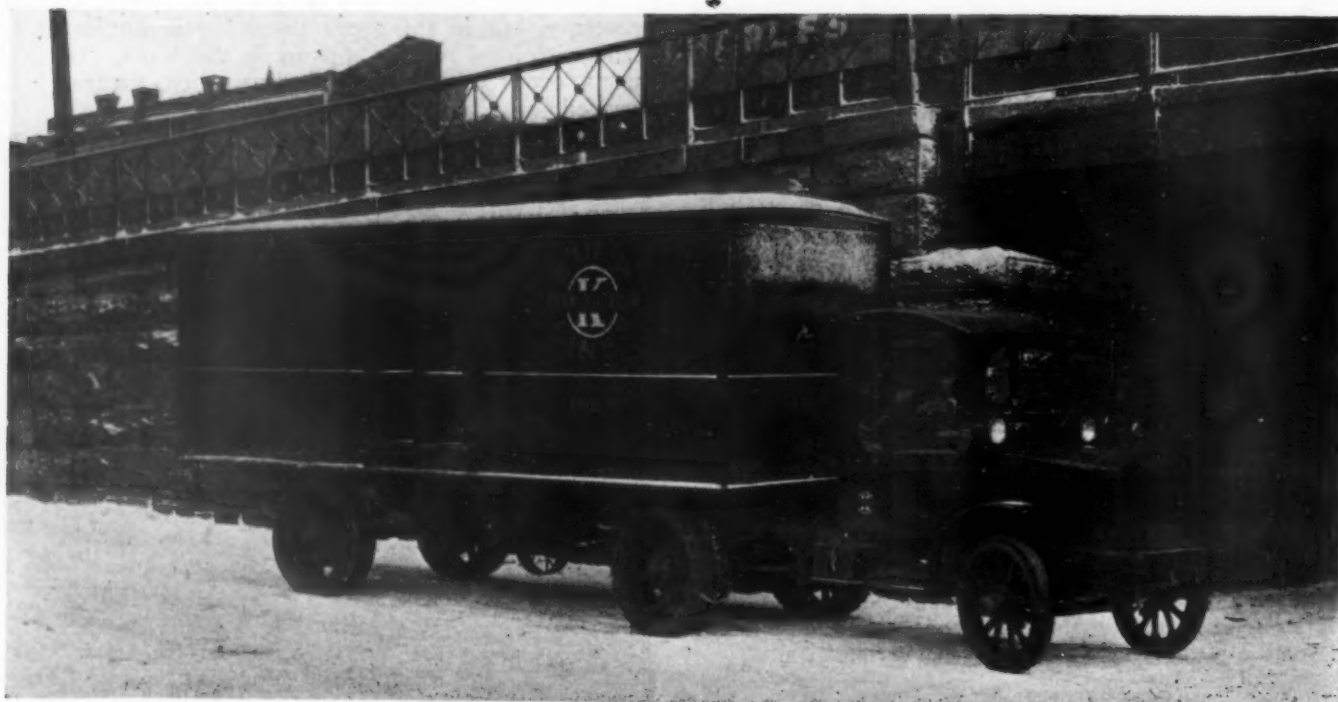
In locations where only a few vehicles are stored, arrangements for storage are made with a local garage which may or may not do the repair work. In some localities, the trucks are stored at the loading platform of the local express office by enclosing the platform on all sides and having doors for exit. This method utilizes space which would not otherwise be used and gives better protection for the loading operation in cold weather. One section or a small adjoining building are used for repair work.

Truck history cards are kept in the general superintendent's office for all vehicles owned by the company, showing the number and type of the complete vehicle and of each unit, together with chassis and body details. If a truck is transferred from one town to another, a record is made, and it is possible to know exactly where every truck is located and what equipment it has on it.

A uniform cost system is in effect in all parts of the country and a recapitulation of the maintenance costs for the country as a whole shows that they have consistently decreased since 1925, due to efficient management and close co-operation of the maintenance forces in the field.

The maintenance policy has a long period of experience behind it, having been developed from the American Express Company before the consolidation, and has been under the same administration for 22 years.

* * * *



Pierce-Arrow Tractor and Fruehauf Semi-Trailer Operated for New York Central by Kulp Transportation Lines at Buffalo

How Greyhound Lines

Get Utmost Service from Units and Parts

*New unit overhaul and parts repair system cuts
costs and increases life of parts*

By W. A. Duvall

General Superintendent of Maintenance, The Greyhound Lines

A MOTOR coach is not a unit in itself, but a group of units consisting of an engine, a transmission, a generator, a driveline, a differential, etc. Its efficiency as a transportation unit depends on the proper functioning of its various parts. Some of these perform better and require less service than others. Successful maintenance procedure must so coordinate the performance of these units that there will be a maximum of operating efficiency and a minimum of repairs.

The maintenance program of the Greyhound Lines has been developed on this unit basis. It calls for systematic inspection and definite scheduling of unit overhaul work. Units are removed from coaches, inspected, repaired and replaced at specified mileage intervals, regardless of whether or not their condition actually indicates the need of service. This procedure is, in effect, a continuous process of rebuilding. Thus, every coach, regardless of age, is always in practically as good mechanical condition as when new.

Careful Records Kept

Under the system which we follow, every important part and unit of each coach is numbered, and a life



Aligning Pistons with Rods, Boring Connecting Rod Bearings and Assembling Pistons and Rods



Final Motor Assembly

record of each is maintained. These records are cross referenced so that the facts on a particular unit may be immediately determined, no matter in what coach or stockroom it may be located.

When a unit is removed from a coach, a heavy manilla tag is attached to it, on which is entered the following information:

- Date removed
- Clock number of mechanic removing part
- Reason for removal
- Maintenance number assigned unit
- Service order number

No parts are discarded unless it is impossible to repair them, or unless the cost of repairs exceeds two-thirds of the cost of a new part. By referring to our carefully maintained unit and parts cost records, it is possible for the foreman to estimate repair costs to within ten per cent of the final figure. Each unit removed from coaches is checked against the records. In case a part does not give service comparable with the record average, it is closely inspected and, if found defective, is returned to the factory for credit adjustment.

The work of our unit overhaul section is highly departmentalized. We find that specialization on one



General View of Unit Overhaul Room



Fitting, Aligning and Boring of Main Bearings—Running in Rebuilt Motors

class of work increases both efficiency and production, and have refined the various procedures of our unit overhaul section to the point where there are fourteen distinct departments, as follows:

1. Cylinder head
2. Transmission
3. Differential
4. Drive line
5. Carburetors, vacuum tanks, etc.
6. Electrical
7. Air compressors and valves
8. Final motor assembly
9. { Fitting and align boring of main bearings
Fitting and assembling pistons, pins and connecting rods
Overhauling of accessory units, such as oil pumps, water pumps, etc.
10. { Shock bottles
Miscellaneous repair, such as jacks, spark plugs, Puro-lators, etc.
11. Building, repairing, recharging batteries, etc.
12. Repairing and testing radiators, Tropic Aire heater cores
13. General machine work, turning down axle shafts, lathe work, miller and shaper work.
{ Welding broken parts, building up broken castings,
valve seats, etc.
14. { Preheating and welding crankcases, etc.
General blacksmith work

The unit overhaul section is laid out so that work "flows" from one department to another. All parts and units removed from coaches, except generators, starters and other electrical equipment, are sent first to the cleaning room, where they are cleaned either by steam jets or by immersion in a cleaning solution. Engines are dismantled before cleaning. After being cleaned, parts are placed on a movable table which can be wheeled direct to that department of the unit overhaul section which is to handle the work.

Handle All Kinds of Work

The unit overhaul machine shop is equipped to handle every type of parts-repair work and testing. We bore, fit and align main crank shaft bearings, grind cylinder



Electrical Test Bench

Two stockrooms are maintained, one for rebuilt parts and one for new parts. Before a part or unit can be withdrawn from the new parts stockroom, the mechanic requisitioning it must have ascertained first whether a rebuilt part is available. Insistence upon this rule automatically insures that all savings made by the unit overhaul department will affect our general maintenance and be reflected in our maintenance costs. A stock of these rebuilt units and parts is also shipped to our branch garages, so that savings in units and parts may be realized wherever possible, and so that our equip-

Greyhound Lines Overhaul Section—Machine Shop Equipment

1—Lathe—8-in. swing, 36 in. between centers
1—Lathe—16-in. swing, 8-ft. bed
1—Lathe—21-in. swing, 12-ft. bed
1—Lathe—42-in. swing, 12-ft. bed
1—Milling machine
1—Shaper, Columbia
1—Cylinder grinder
1—Radial drill
1—Piston grinder
1—200-ton hydraulic press
1—60-ton press
3—Main bearing aligning reamers
1—Power hack saw
1—1-hp. dual grinder
1—6-in. grinder and buffer

1—¼-hp. grinder
1—Rod boring machine
1—Wadell rod boring machine and facer
1—Drill press, 1½-hp.
1—Drill press, 2-hp.
2—Connecting rod aligners
1—Valve spring tester
1—Valve refacing machine
1—Electrical test bench, 3½-hp.
1—Brake riveting machine
1—Mica undercutting machine
1—Growler
1—Spark plug pressure testing machine
1—Crank shaft grinder

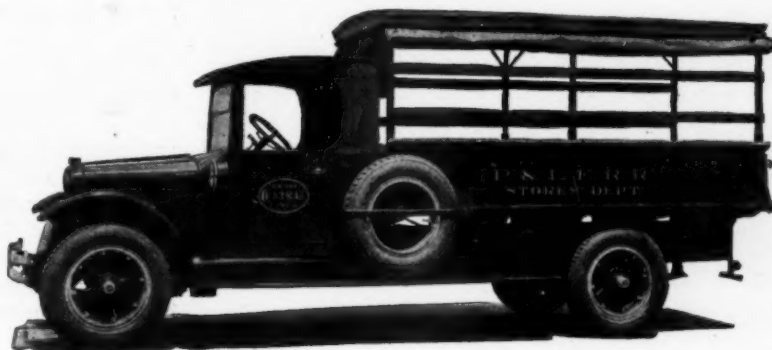
blocks, weld crankcases and broken parts, rebuild electrical units, etc. No outside service whatever is required. Following completion of individual or progressive repairs, the parts are either routed for reassembly, as in the case of engine parts, or if a complete unit, are forwarded direct to the stock room.

ment, no matter where located, may be kept as mechanically fit as that serviced at the main plants.

[This is the third in a series of articles on maintenance facilities and methods of the Greyhound Lines. The fourth will appear in an early issue of the Motor Transport Section.—EDITOR.]

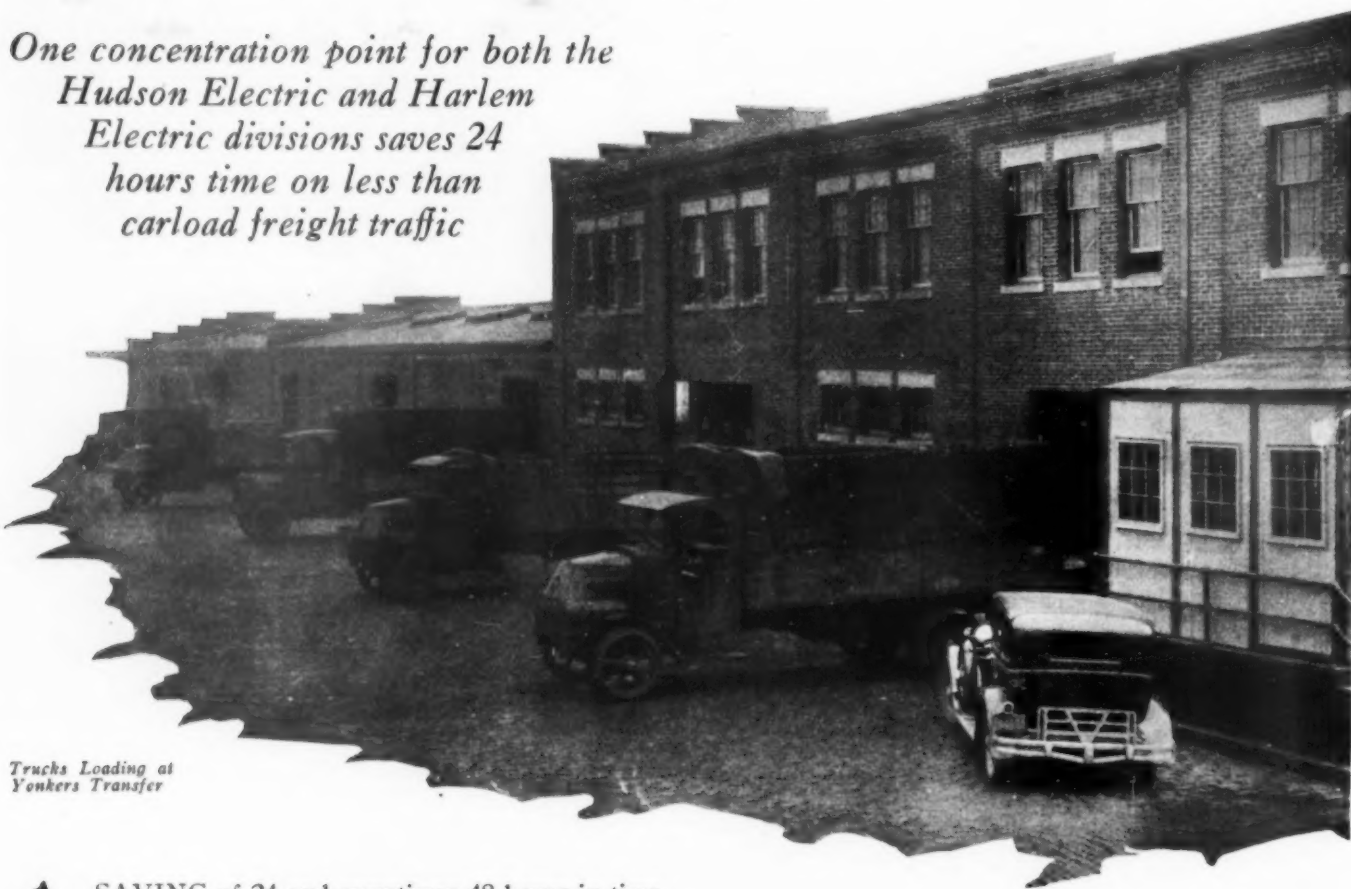
* * * *

Light Truck in Service in the
Pittsburgh & Lake Erie
Stores Department, Pitts-
burgh, Pa.



How New York Central Transfers Freight by Truck

One concentration point for both the Hudson Electric and Harlem Electric divisions saves 24 hours time on less than carload freight traffic



Trucks Loading at Yonkers Transfer

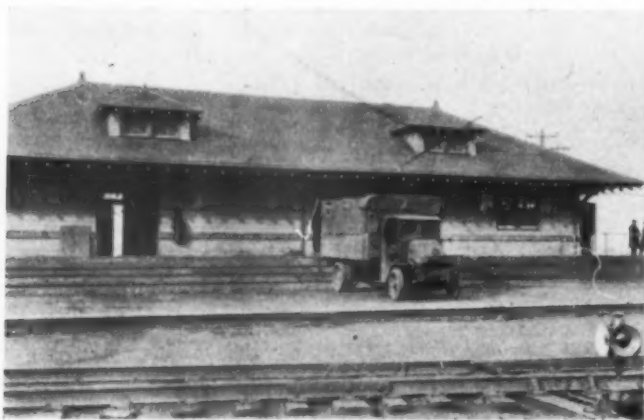
A SAVING of 24 and sometimes 48 hours in time required for the movement of shipments of l.c.l. freight from or to points on the Electric division of the New York Central is effected by the use of cross haul motor truck service between the Harlem side and the Hudson side. The concentration of the freight of both divisions at Yonkers results in a sufficient volume of traffic to load cars which are directly routed to the transfer points of other railroads, eliminating rehandling and consequent delay at a congested New York city transfer station.

The Overland Trucking Company, Yonkers, N. Y.,

operates this trucking service under contract for the New York Central. The territory served is the Electric division of the New York Terminal district. Operating out of Yonkers as a distribution point, the service extends south to Morris Heights and north to Croton on the Hudson side, and south to Fordham and north to White Plains on the Harlem side. The daily routing of the trucks depends upon the tonnage and destination of the freight received, the trucks making all deliveries in the respective territories in which they operate.

Six Routes Operated

The operation is divided generally into six truck routes which, together, serve each freight house between the points mentioned. Route number 1 operates from Yonkers to Mount Vernon and north on the Harlem division to White Plains. Route number 2 operates from Yonkers to Hastings and Dobbs Ferry on the Hudson division. This is a short run and the equipment is used in the afternoon to help out on any other route which may have more traffic than the regular trucks can handle. Route number 3 leaves Yonkers with freight for Irvington and Ossining, and route number 4 covers Tarrytown and Croton, the two routes covering alternate towns along the Hudson division, both continuing to Croton. After loading at Croton



Delivery at Tarrytown

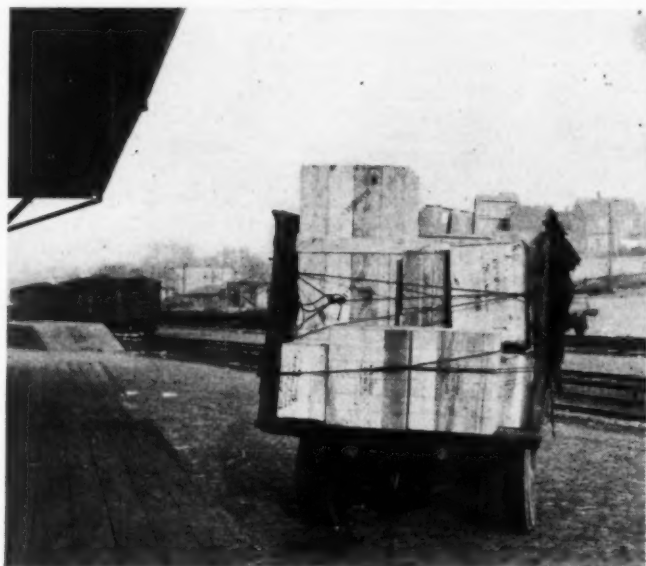
the trucks distribute along the division and also pick up outbound freight for loading out of Yonkers. Route number 5 leaves Yonkers for Kingsbridge, Morris Heights, Fordham, Woodlawn and Mount Vernon. Route number 6 takes alternate towns with route number 1 on the Harlem division to White Plains.

Freight Handling Method

All trucks report at the platform at Yonkers at 8:00 A. M. and are loaded with freight, for distribution on their routes, which has come in overnight to the Yonkers transfer. They make deliveries on the way out and pick up on the way in, although at times it is possible to pick up outbound freight while making deliveries. Each truck has a driver and a helper, the driver being responsible for all way-bills and trucking records. At the larger stations, the freight house truckers help load and unload the trucks, but at the smaller stations the driver and helper do this work.

Equipment Used

The motor equipment used consists of three 5-ton and three 7½-ton trucks, all on solid tires, with open top rack bodies with a tarpaulin for use in inclement weather. Each driver always operates the same ve-



Leaving Mount Vernon at 3 P. M. for Yonkers

hicle unless it is being repaired. The vehicles must be kept in good mechanical condition, due to the very steep grades encountered between the railroad stations and the Albany Post Road which is generally followed on the Hudson division. The railroad tracks follow the edge of the Hudson river, while the Post Road is located on the top of the paralleling ridge with a very steep grade between the two.

Service Only Between Stations

The service is entirely between railroad freight stations, there being no store-door pick-up and delivery while the trucks are handling New York Central traffic. However, by the terms of the contract agreement, the Overland Trucking Company can use its equipment for trucking service for outsiders at any time except when it is providing the regular service of the New York Central. The contractor agrees to furnish all the motor equipment necessary to move the freight



Ready to Leave White Plains for the Yonkers Transfer

traffic in this district. Payment is based upon the tonnage of freight moved.

Dispatching Method

A truck dispatcher at Yonkers supervises all truck loading and routing. While the trucks are loading in the morning for their respective routes, the dispatcher calls all of the larger receiving stations on both divisions and obtains the weight and number of pieces to be picked up for the Yonkers transfer. An estimate of the volume of traffic to be handled at each station is obtained, and if it exceeds the capacity of the scheduled equipment, an extra truck is sent to take a part of the load. Route number 2 is purposely shortened so that the equipment assigned to it will be available for this purpose.

The driver calls the dispatcher again when he has completed his deliveries and is ready to return for pick-up freight, and is given a list of additional stations which have received freight in the meantime.

The dispatcher keeps a close check on the whereabouts of the trucks by obtaining their arriving and departing times from each freight depot on the scheduled route. The delivery and pick-up of freight on any one route is proportioned, as far as possible, to allow the truck to return to Yonkers by 4 o'clock in the after-



Loading at Croton



Truck Operation on the Electric Division of the New York Terminal District

noon to insure the forwarding of its load the same night. Idle time and overlapping are reduced to a minimum.

Operating Plan, New and Old

Two cars come in to White Plains daily from the North, one from the West Albany transfer and the other a pick-up car operating between Chatham and White Plains. Cars come in from the south from 33rd Street and Barclay Street stations, New York, and from Granton transfer, Weehawken. This freight is taken from the cars and loaded on to trucks for distribution to points south of White Plains on truck routes number 1 or 6. The route number 5 truck, after completing the Bronx delivery, departs from Mount Vernon at about 3 o'clock, and takes all local freight received up to that time to Yonkers.

Distribution South of Croton

A similar concentration of freight occurs at the northern extremity of the truck operation on the Hudson side. Freight consigned to points between Croton and Yonkers is unloaded from the cars at Croton and is distributed by the motor truck equipment which handles routes 4 and 5 out of Yonkers. On the way south, these trucks make alternate stops as they did on the way north, both arriving at Yonkers around 4 o'clock. Croton is 19 miles from Yonkers.

Previous to the use of motor trucks, the freight from the Harlem division was picked up by way freight cars which had to be hauled through the Mott Haven yard to Spuyten Duyvil and thence to Yonkers transfer, where it was reloaded for other transfers. This

operation was expensive and subject to considerable delay due to the volume of other traffic at these points. By using the motor truck the freight traffic of both sides of the Electric division is concentrated at Yonkers, and is loaded on direct cars or transfer cars the same night.

Yonkers Layout

Cars are loaded at Yonkers for the following transfer points: Barclay St., 33rd St., 130th St., and Westchester Ave., in New York City; Nepperhan, N. Y., Peekskill, Poughkeepsie, Albany, Troy, and West Albany transfer on the New York Central; Waverly transfer on the Pennsylvania; Elizabethport transfer on the Central R. R. of New Jersey; New York transfer on the D. L. & W.; Oak Island transfer on the Lehigh Valley; St. George transfer on the Baltimore & Ohio; Granton transfer on the West Shore; and Mechanicville on the Delaware and Hudson. Additional cars are loaded direct to destination whenever there is sufficient tonnage.

An example of the saving in time by using the motor truck and Yonkers transfer is shown by a comparison of present and previous routes from Mount Vernon to the New Jersey transfer points. At present, a shipment received at Mount Vernon at 3 P. M. is sent by truck and unloaded at Yonkers at 4 P. M. and put in a car which arrives at Waverly transfer for handling the following morning. Formerly, when sent by way freight, there was considerable delay due to the necessary switching of cars and the same shipment would have taken 1 or 2 days before it reached Waverly transfer.

It is the policy of the New York Central to operate the motor truck service as an adjunct to the freight car movements, and not as a matter of competition between the railroad and the truckmen working for it under contract.

Motor truck service is installed when it will expedite the regular rail freight service of the company, and result in greater satisfaction to those who are regular shippers over its lines.

THE NEW YORK CENTRAL RAILROAD COMPANY
Statement of Freight Transferred by Cleveland Trucking Co. Sheet No. 1
From Yonkers To Yonkers Date Jan 8 1930

| Way-Bill Reference | | No. | Date | No. Packages | Articles | Weight Lbs. |
|--|---------|-----|------|--------------|---------------|-------------|
| From | To | No. | Date | No. Packages | Articles | Weight Lbs. |
| Chicago | Yonkers | 11 | 8 | 2 | By Clothing | 367 |
| St. Louis | " | 12 | " | 1 | By Bags | 209 |
| Pittsburgh | " | 13 | " | 3 | By Paddy | 525 |
| Cleveland | " | 14 | " | 2 | By Groceries | 372 |
| Syracuse | " | 15 | " | 4 | By Tools | 431 |
| Quincy | " | 16 | " | 2 | By Shoes | 228 |
| Utica | " | 17 | " | 5 | By Clothing | 343 |
| New Bedford | " | 18 | " | 3 | By Lumber | 528 |
| Boston | " | 19 | " | 1 | By Books | 122 |
| Bridgport | " | 20 | " | 2 | By Chain | 384 |
| Westport | " | 21 | " | 3 | By Auto Parts | 482 |
| RECEIVED FREIGHT IN GOOD ORDER (Except as Noted Hereon.) | | | | | | Total 4054 |

Signed Cleveland Trucking Co. Signed A. R. Hume
Per Driver H. Cuddy Per Agent W. C. Hume
Checked by A. R. Hume Time 9:00 AM Date Jan 8 Per Agent W. C. Hume
Time Left 9:15 AM Time Arrived 9:30 AM
Truck No. 2 License No. 448-164
(Note—This Space for use of Receiving Agents of Foreign Roads only.)

Motor Truck Freight Transfer Statement

Brake Drums and Linings for Motor Trucks*

How modern transportation conditions, making greater demands of braking equipment, are developing better materials

By G. B. Ingersoll

Chief Engineer, Federal Motor Truck Company, Detroit, Mich.

WITH the insistent demand for better brakes to meet the requirements of transporting goods at increasingly higher rates of speed, together with greater gross tonnage loads, the use of auxiliary-operated brakes has necessitated the development of better grades of brake lining. Ordinary types of brake lining that performed successfully a short time ago are now quickly squeezed out under the high brake operating pressures. In order to meet the new standards, a dense, compact, homogeneous brake lining that will maintain the proper braking action and wear slowly and evenly under hot or cold, dry or wet conditions is demanded.

In a chassis incorporating four wheel hydraulic brakes, quite satisfactory service has been recently obtained in units of 10,000 pounds maximum gross load, with a folded and stitched fabric lining composed of asbestos yarns interspun with brass wires and thoroughly impregnated with a compound to provide for the proper co-efficient of friction, these trucks not being equipped with auxiliary brake operating means. This type of lining is folded and vulcanized under high heat and heavy pressure, the impregnation being done by pressure in order that all fabric and threads comprising the composition be thoroughly coated with the compound.

Experience would indicate that the best grades of this type of lining may be used with success on trucks of the smaller capacities; but a lining must be of the best grade or satisfactory service will not be approached. However, where extreme pressures and heat conditions are encountered, linings of this type possess the disadvantage that, as the various laminations are reached through wear, the chemical reaction and carbonization that result, due to the extreme heat and multiplicity of brake applications under severe service, change the character of the material entirely.

This type of lining is usually fastened with brass or alloy rivets, and care should be taken that the shoes are made to a true diameter preparatory to the installation of the lining; and at the same time the outside surface of the lining after assembly on the shoes should be maintained to a true diameter. This, together with accurate turning or grinding of the inside of the drum, is necessary to insure satisfactory service.

For brakes operated by auxiliary means, molded brake lining has been extensively used with success. This material has a high heat resistance, and the bond used is changed in the process of manufacture so that it will

not soften or become volatile under the application of heat, this resulting in the absence of objectionable smoke or odors and in the maintenance of a uniform co-efficient of friction. As brake operation consists of the conversion of energy due to motion into heat due to friction, heat is undoubtedly the outstanding, determining factor in the consideration of the life or durability of brake lining. As temperatures as high as 1,000 deg. have been recorded in brake operation, brake lining materials of inferior grade will be adversely affected, resulting in burning, glazing, softening, wedging or tearing from the fastenings.

A lining of high grade can be worn practically to the shoes and retain a uniform efficiency through its life, and it is available with friction values suited to the requirements of particular applications. Also, the bond used in this type of lining is not soluble in either oil or water and is, therefore, not inherently susceptible to troubles due to the presence of water or oil between the lining and the drum. The brake will regain its efficiency because the brake lining is incompressible under braking pressures, the lining being initially set up with pressures attained in brake operation.

A relatively thin type of this molded lining is applied on a base of dead-soft steel, punched and shaped to fit the brake shoe, the brake lining becoming a component part of the base. The base plate is extended beyond the lining material, the end extension being used to rivet the brake lining unit to the shoe, thus eliminating rivets through the body of the brake lining.

A relatively thick molded lining for heavy duty service is designed to be mounted on the shoe by means of keepers which fit and operate as wedges within slots in the brake shoes, the keepers being bolted in place. In this design the brake material can be readily replaced by releasing the bolts and keepers by means of a socket wrench.

Another molded, grooved type of lining is made from a self-lubricated, asbestos friction composition and is molded in a homogeneous mass in individual molds for various shapes and sizes. This material is made impervious to water or oil, and its co-efficient of friction does not vary appreciably with moisture or temperature variations. Transverse grooves keep the surfaces between the shoes and the brake drum free from grit and moisture, and tend to polish the brake drum, preventing scoring or wearing of the drum. This lining is of very dense construction and provides very smooth, noiseless operation. Brake liners are fastened with rivets in the usual way and are made to allow for grinding to an exact diameter.

* From a paper presented before the Society of Automotive Engineers, Transportation Section, at Toronto, Ont., on Nov. 14, 1929.

In the early days of the truck industry, almost any type of brake drum having reasonable width and diameter would operate with success under the speeds and loads encountered. Until very recently, pressed steel drums of a .20 to .30 carbon were operated with fair success, but within the last two years there has been a gradual increase in the hardness specifications of drums until today the pressed steel drums that are being used with any degree of success have been increased to a range of .70 to .90 or more carbon content. Still the demand is for brake drum material that will withstand the terrific heat, pressure and friction that are being encountered.

The use of the ordinary pressed steel drum under heavy braking pressure results in undue wear, regardless of the friction material used. As the metal flakes under heat, the flakes imbed themselves in the lining and score the drum. Cast drums of high chromium nickel alloy are now providing a physical structure of a crystalline nature, so that the lining contact is made on the ends of the crystals rather than against a metal grain, eliminating the tendency to flake under extreme heat.

Such a drum possesses an extremely dense structure unaffected by temperature changes, and, with proper brake lining materials, is practically noiseless in operation. This material, as used today, has a tensile strength of 45,000 to 60,000 lb. per sq. in. and high resistance to impact stresses.

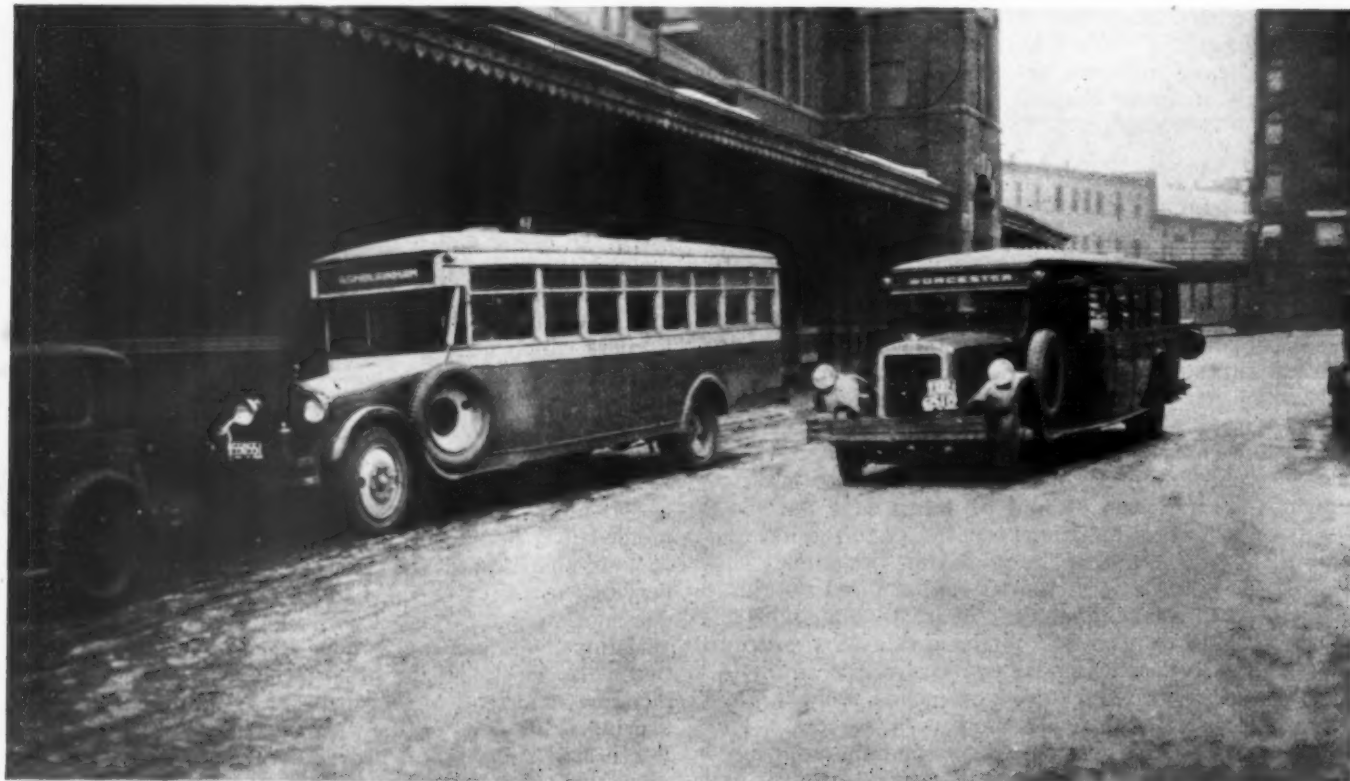
The serious problem in the design of proper brake drums is the question of obtaining sufficient space in which to house a drum of the proper physical proportions. The design of brakes in the past has been to fit the brakes to the wheels, but to accomplish successful brake design in the future we will have to begin to fit the wheels to the brakes. In a recent experimental chassis, it was possible, with the brake pressures de-

veloped, to distort a drum of exceptional thickness, having a flange of generous proportions, so that the deflective movement was easily visible to the eye. The only recourse was to begin to build up the cast drum with the maximum possible ribbing together with maximum wall and flange thickness, so that there remained a minimum of only $\frac{1}{8}$ in. clearance between the drum and nearest portions of the wheel parts.

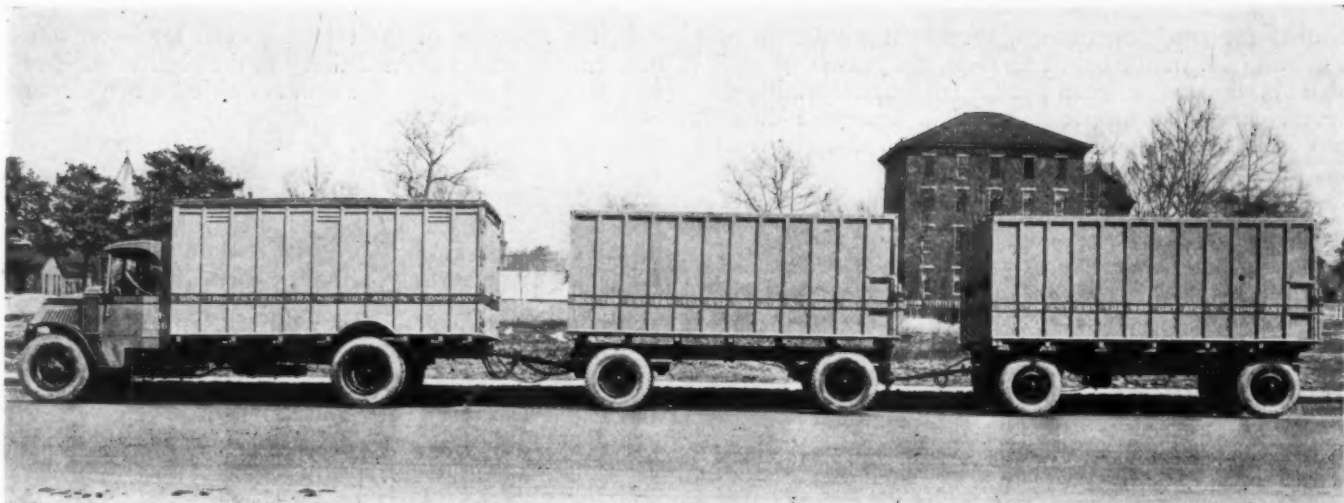
Undoubtedly it will be necessary to increase the popular 20 in. standard base wheel to at least 22 in. to provide a minimum of the necessary air flow space required for dissipation of heat from brake operation. We are inclined to believe that the 20 in. base wheel was thought to be a necessity for motor truck pneumatic tires to conform at one time to the standardized heights of loading docks, car door heights, etc. With the general usage of pneumatic tires for trucks, it was thought necessary to keep the frame as near the old height as possible. However, any sacrifice in this phase of the business will be more than offset by the advantages accruing from better brake operation, even though we neglect the question of additional road clearance, which in many instances will be very desirable.

Brake drums will generally be provided with air apertures in the vertical flanges to further accelerate dissipation of heat, even at the sacrifice caused by these additional points of ingress of foreign material into the drum. Even the slight expedient of drilling a few holes in the vertical worm of the brake drum has been known to double the life of the lining material in service where terrific heat was sufficiently to practically vulcanize the rubber in the tires. With the above described type of drum, 100,000 miles of drum service with approximately $\frac{1}{16}$ in. diameter wear is not impossible. With proper heat dissipation the efficiency of the brake drum and brake drum lining can be greatly increased.

* * * *



Boston & Maine (left) and New Haven Motor Coaches at Fitchburg, Mass.



Taxes on Motor Trucks Are Steadily Increasing

An Analysis of **Motor Truck Taxation**

*Shows special taxes are becoming more
common, most of them based on
privilege of use of highways*

By A. D. Ferguson

Assistant Engineer, Bureau of Economics, Canadian National

THE provision of adequate road facilities has become one of the largest internal problems with which the various state authorities are confronted; and in order to make large sums available for road purposes, motor vehicle owners have submitted to special taxation. At one time, the truck represented a stage in the transition from the passenger automobile to the passenger motor coach, and with its load, it weighed considerably more than the private passenger car. At the inception of the truck, the opinion was apparently quite general (and possibly quite rightly so) that these heavier vehicles, equipped with solid tires, would materially hasten the deterioration of the then existing highways, and it is not surprising, therefore, that the registration fees for these vehicles were made considerably higher than for passenger cars.

Despite the recent trend toward the equipment of trucks with pneumatic tires, the higher fees for trucks still obtain, although in nearly every state the fees for vehicles equipped with pneumatic tires are lower than for those with solids.

Perusal of the methods employed in the various states in the assessment of registration fees reveals considerable uniformity in the basis employed, as 80 per cent of the states use the capacity of the vehicle as a prime factor in the calculation of such fees.

The Taxation of Trucks

The great increase in the use of trucks during the past five years represents to a large extent the entrance of privately-owned trucks into this field of transportation. It may be said, however, that the truck has extended the hauling radius of the horse and wagon, and that,

while a certain amount of road haul is being performed, the real development in truck transportation to date is merely a substitution for the horse and wagon, with an extended radius of operation. As with the motor coach, it is felt that the trucker who uses the highway for personal monetary gain should pay an additional tax over that paid by the trucker who is only transporting the products of his own industry; but until the adoption of a system of reg-

In the *Motor Transport Section* of the *Railway Age* of August 24, 1929, there appeared an article by Mr. Ferguson entitled "The Trend of Motor Coach Taxes." It was considered one of the most thorough analyses of the subject which had ever been made. Now Mr. Ferguson has prepared a similar analysis of motor truck taxes, which matches the first report in its completeness. It throws a good deal of light on a matter which has been the cause of much argument and little understanding.

ulation for truck operations, somewhat similar to that obtaining for motor coach services, the matter of equitable taxation, as between similar trucks performing different classes of service, appears to present a difficult problem. Attempts have been made to classify trucks for taxation purposes, as follows:

- (a) Private Trucks—operated by the owner or his agent and used exclusively for the transportation of his own goods.
- (b) Contract Carrier Trucks—operated by the owner or his agent, and used exclusively for the transport of goods belonging to one other (either individual or firm) under contract.
- (c) Common Carrier Trucks—operated by the owner or his agent, and which offer to the general public a truck transportation service, which is usually limited to definite routes.

During 1929, the term Common Carrier was applied to trucks in eight states, while in seven additional states, trucks operating over regular routes or between fixed termini were made subject to special taxation. In sixteen additional states, some special additional taxation was imposed on trucks, although the classification of the service in which the trucks are engaged was not definitely specified.

Further Study Required

As with the motor coach, the various expedients of taxation which have been applied to trucks must be acknowledged to be of a more or less temporary nature. In an endeavor to ascertain if the various methods employed in assessing taxation on common carrier trucks are tending toward any definite goal, the following analysis has been made of the annual taxation of such vehicles in the various states during the period 1924-1929. The result of this study will clearly indicate that the matter of equitable truck taxation requires much careful consideration and further study.

Whereas in 1924, 23 states imposed special taxes additional to registration fees and a tax on gasoline, by 1929 this number had increased to 31, and it may be said that in recent years there is an apparent trend towards the imposition of special additional taxation on common carrier trucks.

The calculation of the amounts of the various fees used in this analysis are based on the data contained in the annual digest of the Motor Vehicle Conference Committee, entitled "Special Taxation of Motor Vehicles," and the taxes imposed by the various states have been applied to a truck of the following specifications:

| | |
|-------------------------------------|-------------------------|
| Capacity | 5 tons |
| Equipped with Pneumatic Tires | |
| Weight (unladen) | 10,000 lb. |
| Horse power | 30 |
| Value | \$5,000 |
| Gross Income | \$12,000 per annum |
| Gas consumption | 7,142 gallons per annum |
| Truck mileage | 50,000 miles per annum |

Too much emphasis cannot be laid on the fact that a study of this kind does not furnish any key to the actual amounts of the taxes paid annually by common carrier trucks; but it does indicate the relative amounts payable, as based on the various state laws. The taxes paid by common carrier trucks will be considered under the following headings:

- (1) Registration Fees
- (2) Amount of Tax on Gasoline
- (3) Special Taxes

For the purposes of this study, drivers' license fees are purposely omitted, and no attempt has been made to take any cognizance of various property and other local taxes to which these vehicles may also be subjected.

In the majority of the states, special taxes on common carrier trucks are additional to the regular registration fees, and although the primary object of this study is the consideration of special common carrier truck taxation, it is felt that, as the registration fees for all trucks are so large, these fees cannot be completely ignored. The amounts which would have been paid as registration fees for a truck as specified, in each state and in each year from 1924 to 1929, show clearly a complete lack of uniformity, although there is practical unanimity in the bases used for the calculation of such fees. During 1929, the registration fee for the specified truck would have been \$300 in Oklahoma, while in the adjacent states of Kansas and Missouri the similar fee would have been \$100 and \$27 respectively.

Table I indicates for each year since 1924 the relationship of the amounts paid in annual registration fees and the total amounts of the annual taxation on the specified truck. This table reveals that, whereas in 1924 the average registration fee for this truck amounted to \$110.71 and constituted approximately 36 per cent of the total annual average tax, by 1929 such fee had increased to \$129.06, but only represented 21 per cent of the total annual payment. The average registration and other fees are determined by dividing the total, obtained by the addition of the amounts of the fees under each heading in each state, by the number of states. The increase in the amount of the average registration fee during the period under consideration has not been great, and inspection of Table II, in which the taxes under the various headings are reduced to the basis of those paid in 1924, indicates that the increase in registration fees has been 16.6 per cent.

Gasoline Tax

The tax on gasoline is proving easy and inexpensive in collection, and much needed revenues are being derived from this source. The tax on gasoline is paid by all highway vehicles and in this study is not considered as any special tax on common carrier trucks, as any other motor vehicle, which consumed the same amount of gasoline per annum, would pay the same amount in taxation.

Table I indicates for each year the relationship which exists between the amount paid annually as a tax on gasoline and the amount of the total annual tax. The average amount of gasoline tax in each state is obtained as outlined above, and inspection of the table reveals that there has been a very considerable and steady increase in the amount of the average gasoline tax paid. In 1924, this tax amounted to \$99.84 and constituted 32 per cent of the total average annual tax, whereas in 1929 it has increased to \$251.43 and constituted 42 per cent of the total tax. Table II indicates that if we consider the average gasoline tax of 1924 to be 100, then a similar figure for 1929 would be 251.8 per cent—indicating an increase of approximately 152 per cent during that period.

Special Taxation

In this analysis, the special taxes imposed on common carrier trucks, as distinct from the registration fees and the tax on gasoline, will receive consideration under three general headings:

- (a) The kind or form of these special taxes.
- (b) The bases for these taxes.
- (c) The amounts of the taxes.

Kinds of Special Taxes

In this analysis, the kind or form of special taxation on common carrier truck is classified under four general headings, as follows: Flat rate; actual "use" of high-

way; potential "use" of highway; and actual and potential "use" of highway.

(1) Flat Rate.—This tax plays a very unimportant part in the whole picture of special truck taxation, as in 1929 only two states imposed a tax of this description without additional taxation. The rates charged cannot be said to be based on any theory of taxation. It is estimated that during 1929 only 1.5 per cent of the total amount of special taxes paid by the specified truck in each state would have been paid under this caption.

(2) Actual "Use" of the Highway.—During 1929, all states imposed a tax on gasoline, as representing some measure of the "use" made of the highway by each vehicle; but special taxation of common carrier trucks under this caption represented an additional "use" tax. This represents a tax on the value received from the use of a public facility and may be said to be based on the taxation theory of "ability to pay." While in 1924 only six states used this form of special taxation, by 1929 ten states had adopted this kind of tax as a basis for the taxation of common carrier trucks.

(3) Potential "Use" of the Highway.—A tax of this description is a tax on a privilege. The highway is a public facility, and for the privilege of using such for personal gain, it would appear reasonable that some special additional tax should be paid. However, this tax does not give any consideration to the outcome of the exercise of such a privilege; but, until through

dition of the trucking industry, there is little doubt but that the industry would benefit very materially from such a course. While only one state used this form of taxation for common carrier trucks during 1924, it was adopted by three states in 1929.

Bases for Special Taxation

The special taxation to which common carrier trucks may be subjected has been very generally classified into four kinds or forms, and it may be of interest to examine the various bases which are used in the calculation of the amounts of these taxes. Under the caption of special taxation, measured by "actual use of the highway," we find that four different bases have been used during the period under consideration, as follows:

- (1) Gross Receipts—used in four states during 1929
- (2) Ton Mile—used in four states during 1929
- (3) Gross Ton Mile—used in one state during 1929
- (4) Truck Miles—used in one state during 1929

For special taxation, which has as a basis the potential use of the highway, we find that during this period ten different bases have been used in attempts to assess taxation of this kind. During 1929, seven states imposed special taxation on common carrier trucks on some basis which had as a prime factor the carrying capacity of the truck, while in four states the potential ton mile was taken as being indicative of the use which the truck operator might make of the highway.

The third form of special taxation, which represents a combination of the two foregoing kinds, is a combina-

Table I—Common Carrier Truck Taxation—U. S. A.

Tax Calculated in Each State for Truck as Follows:—5 Tons Capacity; 10,000 lbs. unladen weight; cost \$5,000; 30 Horse Power; Pneumatic Tires; Annual Mileage 50,000; Annual Gas Consumption 7,142 Gals.; Gross Receipts \$12,000 per annum.

| Year | Total of Taxes Paid In Each State | % Gross Income | Registration Fee | % Total Tax | Total Annual Gasoline Tax | % Total Tax | Special Tax | % Total Tax |
|---------|-----------------------------------|----------------|------------------|-------------|---------------------------|-------------|-------------|-------------|
| 1924 | 15,080.52 | 2.6 | 5,424.75 | 36.0 | 4,892.27 | 32.4 | 4,763.50 | 31.6 |
| Average | 307.77 | | 110.71 | | 99.84 | | 97.22 | |
| 1925 | 16,963.70 | 2.9 | 5,819.75 | 34.3 | 5,642.12 | 33.3 | 5,501.83 | 32.4 |
| Average | 346.20 | | 118.77 | | 115.15 | | 112.28 | |
| 1926 | 22,282.32 | 3.8 | 6,239.25 | 28.0 | 8,713.24 | 39.1 | 7,329.83 | 32.9 |
| Average | 454.74 | | 127.33 | | 177.82 | | 149.59 | |
| 1927 | 24,356.11 | 4.2 | 5,963.75 | 24.5 | 8,677.53 | 35.6 | 9,714.83 | 39.9 |
| Average | 497.06 | | 121.71 | | 177.09 | | 198.26 | |
| 1928 | 28,099.09 | 4.8 | 6,623.75 | 23.6 | 10,855.84 | 38.6 | 10,619.50 | 37.8 |
| Average | 573.45 | | 135.18 | | 221.55 | | 216.72 | |
| 1929 | 29,550.99 | 5.1 | 6,324.25 | 21.4 | 12,319.99 | 41.7 | 10,906.75 | 36.9 |
| Average | 603.08 | | 129.06 | | 251.43 | | 222.59 | |

proper regulation the common carrier truck is afforded a measure of protection against destructive competition, as is afforded the common carrier motor coach, it is doubtful what real value can be attached to the privilege of operating a common carrier truck between any points. In 1924 twelve states used this form of special taxation for common carrier trucks. During 1925 three additional states adopted this form of taxation, and in 1929, fourteen states used this form of tax.

(4) Potential and Actual "Use" of the Highway.—This taxation represents a combination of the two previous forms of taxation: (a) A tax on the privilege of using the highway for personal gain, and (b) a tax on the outcome of the exercise of this privilege. It would appear that taxation under this heading should prove the most equitable for trucks, although, as previously stated, without regulation it is most difficult to determine any real value of the privilege to operate. With regulation and the issuance of certificates of convenience and necessity, such certificates would undoubtedly have a monetary value, which could be used to determine the value of the privilege to operate. To intelligently tax the outcome of the exercise of this privilege, it is necessary that true accounting methods be introduced into trucking operations; and from the present chaotic con-

dition of the potential and actual use made of the highway. During 1929, three states assessed common carrier truck taxation in this manner, and in each case, a tax on the gross receipts represented the tax on the actual use made of the highway. In two of these cases, the capacity of the truck was taken as being representative of the potential use which might be made of the highway, while in the third instance, in addition to the capacity of the truck, its unladen weight also received consideration.

The fourth form of taxation—the flat rate—was used in two states in 1929, and, as previously stated was not apparently based on any theory of taxation, but rather represented a figure which appealed to the various taxing bodies using it.

Amounts of Special Taxes

It takes but a brief examination of the amounts paid as special taxation in the various states since 1924 to reveal the complete lack of uniformity in this form of taxation. By the addition of the amounts of the special tax paid in each state in each year, we get an amount which may be taken as indicative of the increase in the special taxation of common carrier trucks during this period. In 1924 this total of special taxation amounted

to \$4,763.50, while in 1929 it had risen to \$10,906.75. Table II indicates that, expressed in terms of the 1924 total, 1929 represents an increase of approximately 129 per cent. If these totals of special taxation are divided by the number of states, we have an average special tax for each year.

Table I shows the relationship which this average special tax in each year bears to the total average tax paid by a common carrier truck, and to the other component parts of the total tax. Inspection of this table reveals that during 1924 the average special tax, which would have been paid by the specified truck, was \$97.22, whereas during 1929 it would have amounted to \$222.59; but during 1924 the special tax amounted to approximately 32 per cent of the total average tax in

each other quite closely, while in 1927 the amount collected from "actual use" exceeded that under "potential use" by 22 per cent, and in 1928 by 56 per cent. The curves of potential and actual use in 1929 began to approach each other again, and it is probable that in 1931 approximately the same amounts will be collected under each form of taxation, although the present trend is to assess special taxation on the actual results from the use of the highway. It will again be mentioned that the gasoline tax is not considered as a special tax, and is not included in the amounts collected from actual highway use.

Total Taxes

There has been a complete lack of uniformity in the total taxes of common carrier trucks. The average annual total tax on a common carrier truck, as specified, increased from \$307.77 in 1924 to \$603.08 in 1929. This represents an increase of 95.9 per cent during this period. The greatest increase in taxes paid was in the amount paid as a tax on gasoline, which has shown little indication of remaining constant to date. The special taxation of trucks increased rapidly between 1924 and 1927, since when, while there has been a continued increase, the rate of increase has diminished quite materially.

that year, and in 1929 it represented 37 per cent of the total.

Prior to 1927, the amount paid as gasoline tax exceeded that under special taxation; but in 1927 the situation was reversed, only to return to the former condition for 1928; and in 1929 the special taxation only accounted for 37 per cent of the total average tax, whereas 42 per cent was paid as the tax on gasoline. Any prediction as to the future would be exceedingly difficult.

"Flat rate" taxation has played a small part in the annual taxation of trucks, representing in 1929 only 1.5 per cent of the total special tax collections. Truck taxation has been in a generally chaotic condition, but the taxing authorities are continually searching for an equitable basis of taxation of the common carrier truck. In 1924, the amount collected under "actual use" taxation exceeded that under "potential use" by 6 per cent of the total collection; but in 1925, the latter exceeded the former by approximately 35 per cent. In 1926, the amounts collected under these two forms approached

In an endeavor to ascertain what relationship exists between the total average annual tax and the annual gross income, the total annual tax, as well as its three component parts (registration fee, gasoline tax and special tax), has been expressed as a percentage of the gross income. We find that in 1924 the average truck tax represented a payment equal to 2.6 per cent of its gross income, while in 1929 this percentage increased to 5.1 per cent, and it will probably approach 5.5 per cent of the gross income in the near future.

Thus we see that the common carrier truck pays approximately 5 per cent of its annual income in taxation, and as its contribution towards the maintenance of its right of way. Analysis of the Class I steam railways' accounts under "Maintenance of Way & Structures" reveals that approximately 12 per cent of their operating revenue is spent on maintenance of right of way only, and that consequently the truck apparently enjoys a distinct advantage in competing for common carrier traffic.

* * *





One of the 90,000 Motor Coaches—Regulated in Intrastate Service, Unregulated in Interstate Service

Argue Interstate Motor Coach Regulation

Advocates and opponents of Parker bill appear before House committee on interstate and foreign commerce—Provisions of bill

HEARINGS on the Parker bill to regulate interstate commerce by motor vehicles operating as common carriers of persons on the public highways, which was re-introduced in Congress by Representative Parker on January 6 as H. R. 7954, were concluded in two brief sessions before the House Committee on Interstate and Foreign Commerce on January 8 and 9. The bill now pending is similar in most respects to that introduced by Representative Parker at the previous regular session of Congress, with a few changes to make it conform to the Couzens bill in the Senate.

Two Opposing Witnesses

Only two witnesses appeared in opposition to the bill. Testimony was given that the measure is now in a form which has been assented to by representatives of the railroad and public utility commissions, the steam and electric railways, the independent motor coach operators, and the manufacturers' association. It was admitted, however, that any one of these interests, acting alone, might have asked for certain changes in the bill, so that the bill, to a considerable extent, represents a compromise between the various interests who have been willing to make concessions to each other in order to secure early passage of such regulatory legislation.

Testifying in opposition to the bill on January 8, Day Baker of Boston, Mass., representing a number of small independent motor coach lines, expressed the opinion that regulation would retard the development of motor coach transportation and would curtail competi-

tion. Mr. Baker was followed by D. W. Pride, an operator of motor trucks, who appeared on behalf of the New York Board of Trade. Mr. Pride opposed motor vehicle regulation in principle.

Favorable Testimony

Proponents of the Parker bill, on January 9, acceded to the request of Chairman Parker that they confine their testimony to that of as few witnesses as possible. Those who appeared in support of the bill were Pyke Johnson, Washington representative of the National Automobile Chamber of Commerce; E. W. Wakelee, vice-president of the Public Service Corporation of New Jersey; Ivan Bowen, counsel for the Greyhound Lines; A. R. McDonald of the Wisconsin Railroad Commission and chairman of the legislative committee of the National Association of Railroad and Utilities Commissioners, and John E. Benton, general solicitor of that association.

Opponents More Concerned With Truck Regulation

Mr. Wakelee expressed the opinion that the opponents of the bill who had testified on the previous day were more concerned with interstate motor trucking than with interstate motor coach operation. In his testimony, he described the hiatus which now exists because most of the states have some form of regulation of passenger motor vehicle operation, while there is no regulation of interstate traffic of this kind. He contended that there is no difference between intrastate and

interstate operation to justify such an exemption. It would be just as logical, he said, to regulate operations north of a given geographical line and to exempt from regulation operations south of that line.

Public Demands Regulation

Mr. Wakelee pointed out that the provision for insurance only, which some members of the committee on interstate and foreign commerce appear to advocate, is not sufficient to assure adequate service or regular schedules. He said that the fact that regulation has been adopted in nearly all states is an indication of the public need and demand for it, and that it should be expanded to the extent necessary to permit it to cover interstate traffic.

N. A. C. C. Statement

Mr. Johnson presented the following statement prepared by a special committee of the National Automobile Chamber of Commerce:

Whenever the Congress and other agencies of the government have had under consideration the question of regulation of the motor coach as an instrument in interstate commerce, representatives of the National Automobile Chamber of Commerce have made appearance and have stated their belief in the principle of regulation in the public interest. For several years, representatives of the motor industry have sought upon every occasion to co-operate with representatives of the public and of other agencies of transportation in an effort to arrive at conclusions which would protect the public interest in efficient transport of all kinds.

As a result of these several discussions and conferences, representatives of the railroad and public utility commissions, the steam railroads, electric railways and motor coach operators have now agreed upon proposals contained in the bills submitted to Congress by Senator Couzens of Michigan.

This measure has been carefully considered by the members of a special committee appointed by the board of directors of the National Automobile Chamber of Commerce. We believe that, in the main, it protects the public interest and that its provisions are as adequate as can be any provisions written in advance of experience.

Compromise on Certain Points

It has been our judgment that highway transportation should stand or fall solely on its merit and the desire of the public for this form of communication. Consequently we have consistently opposed that section of the bill (5b) which would require the commission to take into account "existing available transportation services" in the issuance of certificates of public convenience and necessity. We still hold that this language is unnecessary in the public interest and that it might operate to the disadvantage of those who desire to travel over the road. But we are ready to accept the judgment of those who propose it, at least until it shall have been given a fair trial.

We have held and still believe that motor coach transportation rates should not be subject to regulation, at least until it has developed that the public interest is adversely affected by existing rates. Again, however, we are ready to accept the judgment of those who propose this regulation until experience has demonstrated whether or not it is desirable in the public interest.

We anticipate that other sections of the bill may be found open to criticism and that probably perfecting amendments will be found necessary, but we also believe that motor coach transportation has now come to occupy such an important place in the transportation structure of the country that the public should have every advantage which may come to it from fair, constructive regulation.

Oppose Truck Regulation

In making this statement, may we again point out that at all times we make an exception of the motor truck. As time has gone on, we believe that events have reinforced our original position that by its very nature, the truck constitutes a flexible agency in the carriage of commodities whose service to the shipping public rests upon its entire freedom from regulation except as to the protection of life, limb and property, which is fully provided for by the regulatory laws of all the states of the Union.

With the sincere belief, then, that time has been gained rather than lost by the careful consideration which Congress has given this question and by its refusal to be hastened into ill-considered legislative action, we again join with the other groups in asking that your committee give favorable consideration to the preparation of a law providing for the regulation of the motor coach as an instrument in interstate commerce.

Following the testimony of the advocates of the Parker bill, the remainder of the session was taken up with questioning of witnesses by members of the committee who hold the position that the only regulation necessary is the requirement that operators give bond to ensure protection to passengers and employees. This view is represented by bills introduced in Congress by Representative Hoch of Kansas, and Representative Huddleston of Alabama.

Provisions of Parker Bill

Representative Parker's present bill, H. R. 7954, makes the administration of its provisions the duty of the Interstate Commerce Commission and of joint boards to be created from the membership of the state commissions, which will act as federal agencies. The bill provides that operators of motor coaches in interstate commerce must secure certificates of public convenience and necessity authorizing such operation. Operators in business on the date of the approval of the act are granted 90 days in which to file applications for certificates.

The "grandfather" clause of the present bill reads as follows: "Provided further that if a motor carrier or its predecessor in interest was in bona fide interstate operation over any route on the first legislative day of the session at which this act is enacted, and (except as to seasonal service or interruptions of operation over which the applicant or a predecessor in interest had no control) continuously has been so operating since that date, and such motor carrier shall make application to the commission for a certificate of public convenience or necessity, it shall be served by the commission with a questionnaire in respect to the matters which, in the judgment of the commission, shall constitute *bona fides* of operation, which questionnaire the applicant shall answer within 90 days from the receipt thereof; and if it appears from the answers to such questionnaire or from information furnished by any board that the operations of such applicant are bona fide for the purpose of furnishing transportation to the public and of continuing the same for a reasonable period, a certificate shall be issued to such applicant as a matter of right." Under this provision motor coach companies in bona fide operation on Dec. 2, 1929, the day the present session of Congress convened, will have no difficulty in securing their certificates to permit them to continue their operations.

Under the present Parker bill, certificates may be transferred, and security for the protection of the public will be provided in accordance with rules and regulations which the commission may lay down, governing the filing of bonds, policies of insurance and other such security.

States' Rights Protected

It is specifically provided that the act cannot be construed to affect the powers of taxation of the state, or to authorize a motor carrier to do an intrastate business on the highways of any state. The Interstate Commerce Commission would have no jurisdiction or authority over intrastate commerce by motor carriers, and the commission is expressly prohibited from interfering in

any way with attempting to regulate such intrastate commerce.

The bill also provides that any corporation or person which may now or hereafter engage in the transportation of passengers by motor vehicles or which now or hereafter may own or control such a motor carrier shall be relieved of the operation of the "anti-trust laws" and of all other restraints or prohibitions by any law "in so far as may be necessary to enable it to own, control and operate, either directly or through a subsidiary corporation, such motor vehicles upon the public highways for the transportation of persons, property or mail." This provision opens the way for railway operation of motor vehicles in co-ordination with train service.

Provisions of the Hoch Bill

H.R. 7699, a bill introduced by Representative Hoch, provides only that operators of motor coaches in interstate service must provide a surety bond. This bond must bind the surety thereunder to compensate any person for personal injury, death, damage to and loss of property, and failure to perform, in whole or in part, any contract of carriage, if and to the extent that such carrier is liable therefor by law, and if the injury, death, damage, loss or failure occurs in connection with or as the result of such operation or use. The amount of such a bond would be fixed by the Interstate Commerce Commission. The bill would not require the payment of compensation under the bond of more than \$5,000 in the case of immediate death, or more than \$7,500 in case of injury or death other than immediate death.

Trucks Instead of Trap Cars Effect Savings

By D. O. Duetlet

General Superintendent of Transportation, Missouri Pacific

EARLY in the year 1924, a study was made of the handling of our l. c. l. merchandise business from our Biddle Street station, which is in North St. Louis and located on Terminal Railroad Association tracks, to our Seventh Street (westbound) and Gratiot Street (southbound) stations, looking to the use of truck service in lieu of trap car service.

The trap car system provided for loading the cars during the day, switching them at night to our Seventh Street and Gratiot Street stations, transferring the shipments, and forwarding from there on the following evening. In other words, such shipments sustained a twenty-four-hour delay as compared with the Seventh Street and Gratiot Street service.

Better, More Economical Service

The truck system was adopted because that mode of transportation gives a better service and is more economical. The high lights of the results are as follows:

1. Elimination of the twenty-four hour terminal delay, or advancing the forwarding twenty-four hours.
2. Saving of approximately 52 cents per ton, or about \$1,000.00 per month.
3. Saving of eight cars per day, or 214 cars per month.

This arrangement not only expedites the movement of shipments and enables their handling at less cost, but the elimination of trap cars makes more room at

our Seventh Street and Gratiot Street stations for the handling of other transfer cars.

The elimination of switching and handling of trap cars, both to the Terminal Railroad Association of St. Louis and Missouri Pacific, not only meant a saving in money from the standpoint of switching and per diem, but it has also enabled us to cancel all schedules from our Biddle Street station. We have not loaded a car from this station since the middle of December, 1928, all shipments being handled from that station by truck; and this means a saving of 275 additional cars, 2,200 car days, or \$2,200.00 in per diem per month.

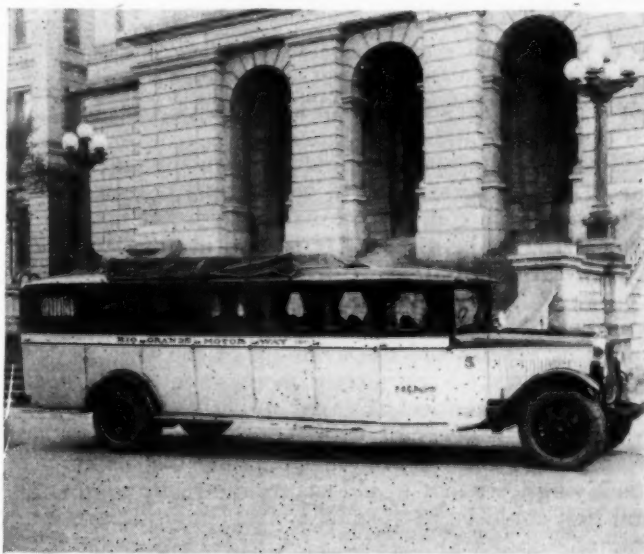
Operation Scheduled

We load the trucks, and the trucking company unloads them. The trucking company, under our contract, agrees to furnish adequate service at all times, and has done so to date. The truck service is operated on regular schedules. Four trucks leave Biddle Street station about 11:00 a. m., and four about 2:15 p. m.; and whatever additional trucks are needed for the clean-up leave about 4:15 p. m. The number of trucks required, of course, varies according to the tonnage offered for movement. We have encountered no objectionable features due to the truck service since it was placed in effect on January 23, 1924.

In addition, we are handling inbound shipments for points destined beyond St. Louis between our Seventh Street and Gratiot Street stations by truck, which expedites the movement twenty-four to forty-eight hours, and in some instances seventy-two hours, and at the same time is more economical.

THE EXECUTIVE COMMITTEE of the National Conference on Street and Highway Safety, in a recent statement, predicted that the final highway traffic fatality figures for 1929 would pass all previous records, exceeding 1928 both with respect to population and rate per vehicle. The statement also pointed out that various committees of the conference composed of traffic executives in many sections of the country are at work on programs dealing with enforcement, legislative and technical methods. Some 26 states, it continues, have adopted the Uniform Motor Vehicle Code, in whole or in part, but the executive committee considers that the spread of this uniform legislation must be accompanied by a thorough enforcement of the statutes if benefit is to be obtained.

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D. & R. G. W. Motor Coach Operated in San Luis Valley

A Fleet Operator Discusses **Fuel Specifications***

By Adrian Hughes, Jr.

Superintendent of Bus Transportation, United Railways & Electric Co., Baltimore, Md.

DISCUSSION of fuel specifications from the viewpoint of the purchaser should be helpful in the efforts that have long been under way to improve economies in the propulsion of vehicles with crude-oil products. Today, few operators know what kind of fuel they need, and none of them knows how to specify the fuel he wants to purchase. Most of them, however, are dissatisfied with the situation, and many of the larger operators are making efforts to obtain definite information about fuel and fuel performance with a view to finding a remedy for it. The subject is highly technical, and the average operator experiences great difficulty in attacking it. Frank discussion by representatives of the oil refiners, the engine manufacturers and the operators so that each will understand the requirements and the problems of the others, followed by a sincere effort to co-operate, is certain to result in an improvement in the situation that will be satisfactory to all.

In the operation of motor trucks and motor coaches, large fleet operation is becoming the rule rather than the exception. This tendency is increasing and undoubtedly will reach large proportions and have an increasingly greater effect on fuel specifications, on the kind of fuel produced by the refiners, and on engine design. The larger a fleet operation becomes, the better it will be equipped with capable engineers who will carry on reliable experiments and research leading to more satisfactory service and greater economies. Also, it will mean that both fuel and equipment will be purchased in larger quantities.

Present Requirements in Fuel

For an operator to state definitely his requirements for a fuel is comparatively easy. They are as follows:

- (1) Economy; that is, high mileage per gallon of fuel.
- (2) Power, both for accelerating and for heavy pulling. This includes smooth engine performance.
- (3) Freedom from knocking.
- (4) Low engine maintenance cost and long life of engine. This includes the minimum dilution of the lubricant and the minimum carbon formation, which interferes with economy, power and long life, and causes interference with service for frequent cleaning.

However, the operator finds it very difficult to prepare a specification that can be submitted generally for bids in an open competitive market and that will assure his obtaining the required qualities in the fuel. Although the results that are required from the fuel are well known, only recently has any clear understanding been reached as to the definite relations between these operating results and the make-up of the fuel, even by the specialists. Even among them some of the points have not been entirely cleared up. Operators in general are not conversant with these technical facts, and if they were they would still be facing the difficulty of specifying tests that would ensure the required qualities and that could be performed conveniently in practice.

* From a paper presented before the Pennsylvania Section of the Society of Automotive Engineers.

One of the complications in determining the qualities a fuel should have is that it must function under many extreme conditions. No other device is required to operate under such extremities of load or temperature as does the automotive engine. As such conditions cannot be avoided, it appears at present that the fuel must have the necessary qualities to meet them. Another difficulty met in practice is that, as nearly every fleet consists of groups of vehicles purchased at different times and from various manufacturers, the engine characteristics of each group may vary widely. Therefore, to obtain satisfactory operation and the maximum economy, several grades of fuel might be required.

The fleet of the Baltimore Coach Company, which is the motor coach operating subsidiary of the United Railways & Electric Co. of Baltimore, consists of 122 vehicles, all mechanically driven. The fleet includes engines of eight distinct types or models. The operation is entirely within the city, with the exception of the chartered business, and covers about 2,500,000 motor coach miles per year. In 1924, with the advice of a firm of local chemists, a specification calling for a 42-per cent benzol-blend fuel, having an initial boiling point of 132 deg. Fahr., was prepared, as it had been concluded from experiments that such a fuel would not produce any appreciable engine knock. This fuel proved rather satisfactory, the price differential was not great in comparison with straight gasoline, and an appreciable saving in engine maintenance and carbon cleaning seemed to be apparent. Experiments in 1927 with the straight gasoline then available, which was very superior to that produced eight or nine years before, showed that the cost per vehicle mile for fuel was probably slightly higher with the benzol blend, but it was considered that the saving elsewhere justified its use.

In the fall of 1928 a revised specification, in which the benzol was reduced to 35 per cent was adopted. Blended fuels were being used more commonly by oil companies, and this reduction in benzol content was made for the sole purpose of trying to get into a more competitive market.

Two Year Test Program

Having in mind the continuance of our investigations on a somewhat larger scale, the contract for fuel included a specification for straight gasoline and also a provision for changing to any other kind of fuel that might be found desirable, with suitable arrangements for arriving at a price. In January, 1929, arrangements were made for a rather ambitious program of investigations to extend over a period of two years, the duration of the present contract, with the object of determining definitely the kind of fuel that would be most satisfactory and economical. The test will include standard gasolines and blends, and possibly special fuels.

Two groups of motor coaches are under test opera-

tion at the present time. The first group consists of nine double-deck coaches operating on a route through the center of Baltimore from north to south, the north end being in the residential section, and the south end being in the congested business section. The topography is rolling, with a general down-grade from north to south. These motor coaches are housed in a closed, but poorly heated, garage, and are operated about 25,000 coach-miles per month. They are equipped with six-cylinder engines of 77 maximum b. hp., and the conventional vented cooling system. Certain straight gasolines produced a fair mileage per gallon but failed to give the necessary maximum power when required. These gasolines were found to have relatively equivalent initial boiling and 50-per cent points in comparison with other more satisfactory gasolines, but their end-points were in the neighborhood of 395 to 400 deg. Fahr., whereas those of a higher end-point, around 415 to 425 deg. Fahr., gave ample power under all conditions. In tests conducted so far, these high end-point gasolines have not given much trouble from crankcase oil dilution, but as the tests progress into the winter months, more comprehensive information may be available.

The second group consists of ten 25-passenger single-deck coaches equipped with four-cylinder engines, which are operated on a city route from east to west, the east end being in the residential section and the west end in the congested business section. Here again the topography is rolling, the grades being about equal in both directions. Parking is largely restricted on this route, and the boulevard-stop system applies over about 60 per cent of the distance. However, the stops, slowing down and acceleration made necessary by receiving and discharging passengers are numerous. These motor coaches are housed in an unheated garage and are operated about 26,000 coach-miles per month.

The four-cylinder engines develop 54 maximum b. hp. and are equipped with the Foutz cooling system. This is a closed water-cooling system which heats up quickly and operates at temperatures considerably higher than those of the conventional system and which are uniform under varying external conditions. Here again, the high end-point gasolines have developed appreciably more power and shown no effect on dilution, undoubtedly because of the high cylinder wall temperature.

Curves plotted from the daily operation of these tests, including also relative atmospheric humidity and temperature, show evidence of an increase in miles per gallon with an increase in humidity. Tests conducted at the Bureau of Standards have shown decreased horsepower with increased humidity. No definite conclusion has been reached at this time as to the reason for the results indicated in the Baltimore tests, but it seems that under certain conditions, with the engine operating normally much under full power, an effect may be produced on the combustion mixture which tends to give better operation of the engine as a result of greater moisture content of the air.

Tests of each grade of fuel in one of the groups of motor coaches are continued for a full month, and an effort is made to keep the equipment in about uniform condition. A general inspection is made at the end of each test. Such tests may be open to criticism on the ground that there are many factors which cannot be measured. However, they have an advantage over laboratory tests in that the fuels are subjected to the conditions which have to be met in practice. An operation of 25,000 vehicle-miles over a period of one month should about average up all the various factors.

The research which is being carried on in the laboratories of the Bureau of Standards and of the oil companies has made possible the development of qualities in fuels to meet the various conditions occurring in practice and has brought about an improvement in fuels now available, but so far nothing is available from such research which the operator can use in making his purchases. The operators and the engine manufacturers are in the hands of the oil companies and cannot write specifications for fuel that will have much effect on refining processes. The only way in which a specification can be obtained that will ensure to the operator a fuel in a competitive market that will meet his definite requirements is by the same kind of co-operation between the petroleum industry and the operators that obtains between the petroleum industry and the engine manufacturers. The petroleum industry has done considerable research work to ascertain the qualities needed to give the operating performance that is required. It can also produce means to be used, either in lieu of or supplementary to the present chemical analysis universally used, for conveniently testing or checking fuel purchased.

Perhaps the situation has not been thought of in this way, but the operator is like the innocent bystander; any change made by the engine designer or the gasoline producer leaves the operator in a quandary. Operators are of course, trying to help themselves. Experiments and studies such as we have been conducting in Baltimore are being made by most of the large transportation companies, and some of these experiments are more or less spectacular. For example, we have been experimenting in Baltimore for four years with an improved cooling system, which not only assures adequate cooling at all loads, because its capacity for the dissipation of heat varies directly with the load on the engine, but also makes possible the operation of the engine at considerably higher cylinder-wall temperatures. This is the Foutz System with which the four-cylinder engines used in the fuel tests previously mentioned are equipped.

Higher Cylinder-Wall Temperatures

The advantages of higher and more uniform cylinder-wall temperatures are well understood, and efforts have been made for a number of years by automotive engineers to develop a cooling system that would give these results. The system in use on our motor coaches seems to solve this problem and, although the manufacturers have so far manifested little interest in it, they undoubtedly will realize its advantages. It is also of interest to the petroleum industry in that it should make possible the utilization of a somewhat lower grade, and therefore cheaper quality, of gasoline.

Another of the spectacular experiments has been the effort to use a so-called crude oil in the gasoline engine. For this purpose a vaporizer has been developed which ensures the vaporization of this fuel before it enters the cylinders. As this fuel probably corresponds somewhat to the gasolines of 1917 to 1919, it is very likely that its use would bring back the dilution troubles of that time. Even the use of vaporizers may not prevent this, for with such fuels dilution probably is caused, not so much by failure to vaporize in the first place, as by failure to remain in the vapor state in the cylinder. Maintenance of higher cylinder-wall temperatures by means of the cooling system referred to might solve these difficulties.

These fuel oil tests are being made exclusively on gasoline-electric motor coaches. Considerable difference might exist in its use on these vehicles as compared with

use on a mechanically driven vehicle. The conditions of starting and accelerating are not the same, and an electric drive probably tends to smooth out an unevenness in power delivery by the engine, although a somewhat greater loss occurs between the engine and the rear wheels. The results, however, will make a valuable contribution to the study of automotive vehicle operation.

A third spectacular experiment is the effort being made by a large fleet operator to go directly to the Diesel engine, using ordinary fuel oil. A motor coach equipped with such an engine was driven to Atlantic City during the American Electric Railway Association convention, held there from Sept. 28 to Oct. 4, 1929. We were told that the oil consumption produced about 8 or 9 miles to the gallon, and that the fuel costs but 5 cents per gallon as compared with 11 cents for gasoline. The statement was made that the use of these engines was entirely experimental, and that no claims are made for it except that it holds interesting possibilities. Here again, the cooling system in use in Baltimore might be very desirable; in fact, it is probably of even greater importance on the Diesel engine than on the gasoline engine. The advantages of the quick warming-up, uniform temperatures under all conditions, higher cylinder-wall temperatures, and the great reduction in the quantity of water, with resulting reduction in water-jacket size, would greatly simplify the use of Diesel engines on motor coaches or trucks, and also in other applications.

I mention these several experiments because they represent efforts on the part of operators to find a way of using fuel of low grades. They may indicate to the oil companies and the engine manufacturers that the large fleet operation will make it possible for operators to influence the development of engines and fuel, and show them the ideas at present prevailing in the operators' minds.

Method of Purchasing Fuel

In connection with the discussion of fuel specifications, consideration should be given to the method of purchasing fuel; that is, whether it should be bought in bulk and distributed by the user or purchased at tank-wagon prices and delivered by the oil companies. Considerable difference of opinion on this point exists among operators. Some large users are using one method and some the other. For bulk purchase it usually is necessary to install storage tanks and operate tank trucks for redistribution. Operators who are using this method feel that they are saving money by it. We have given careful consideration to this matter in Baltimore, but are still buying on tank-wagon delivery. If money can be saved by the bulk-purchase method we shall change to it, but it should be possible for the oil companies to do the handling more cheaply and satisfactorily than can the operator. This matter should be given consideration by the oil companies. Co-operative study should settle the question whether the transportation companies, as consumers, must go into the business of storing and handling fuel, or would save money by leaving this local distribution to the oil companies, which are more experienced in such work.

Whichever way purchases are made, a more satisfactory basis for measuring the fuel should be adopted. A small variation in gallonage in tank-wagon deliveries or even tank-car deliveries may amount to a great deal in the course of a year. Some thought should be given to the use of a volume correction factor to correct for change in temperature. The establishment of a uniform

practice is very desirable. Accurate measuring methods also are important in the use of fuel by operating companies, and considerable improvement has been made in recent years by the companies furnishing measuring devices and pumps. This is important not only to the operating companies in connection with statistics pertaining to their costs and operating efficiencies, but also to the oil companies, as the satisfactory performance of any given fuel is often determined from such records. Experiments have been conducted for a period of years to develop a suitable gasoline meter for application to individual vehicles. We are trying out such meters in Baltimore, and if they prove to be satisfactory they will be of great value, not only in testing fuels but in many other ways.

The indications are that specifications for gasoline for the future will require:

- (1) Ability to give good starting at the lowest temperature to which it is subjected, to be determined by temperature at the 10-per cent point of the A. S. T. M. distillation curve and the slope of the curve at this point.
- (2) That at the 50-per cent point, the curve shall be low enough to give satisfactory acceleration.
- (3) A high enough temperature at the 90-per cent point to give ample power when required.

In addition, the fuel must have low knock-value and the sulphur content must not exceed 0.10 per cent. The new federal specifications, test methods and requirements give a fair outline of the possible methods to be used. More important than this, however, is the development of some method by which the operator can perform tests upon samples of the fuel as delivered, to assure him that the fuel has the qualities specified. The operator should not be concerned with what is put into the fuel or how it is refined or blended, but rather with the results that can be obtained from it.

Some test devices are now in use to a limited extent, such as the Midgley bouncing-pin machine for determining antiknock properties, and the Ricardo machine for determining the highest useful compression. The development of test equipment and methods that can be used in common practice is very desirable.

Four grades of fuel are generally available, as follows:

- (1) Straight-run gasoline.
- (2) High-test gasoline.
- (3) Benzol-blended fuel.
- (4) Ethyl-blended gasoline.

I should like to ask the manufacturers to make known which of these four grades they recommend to be used for each model they are now producing. This would influence the operator not to use a fuel which is markedly unsuitable for the engine.

I should like to ask the oil companies to submit a specification and methods of tests for each one of these four grades of fuel. As the operator cannot determine accurately, by any kind of test or experiment, the differences between fuels of about the same grade, it will be better to eliminate any difference; therefore, I propose standardization of the grades of fuel. Perhaps we should have five or six grades, but no one can produce good reasons why they should not be standardized.

If these things are done, the operator can be sure of obtaining correct fuel for his equipment and the benefits of the lowest legitimate prices in a competitive market. The motor coach and motor truck manufacturer can be sure of the best performance of his equipment up to the limits of its design. The oil companies can depend upon equal and fair opportunity to capitalize their enterprise and efficiency. This is an ideal, to be sure, but every development in our civilization is the realization of an ideal. This one can be realized through co-operative effort.

Union Pacific Operation Attacked

Pickwick-Greyhound Lines charge violations of Interstate Commerce Act in complaint to Interstate Commerce Commission

CHARGING numerous violations of the Interstate Commerce Act and of the Transportation Act of 1920, the Pickwick-Greyhound Lines, Inc., and the Pickwick-Greyhound Lines, Inc., of Illinois, have entered a complaint with the Interstate Commerce Commission against the purchase by the Union Pacific of the Interstate Transit Lines, and against the methods of operation of the latter company. The complaint has been docketed by the commission as no. 22982. Both the Pickwick-Greyhound Lines and the Interstate Transit Lines operate motor coach services between Chicago and Omaha and westward, and between St. Louis and Kansas City and westward, and are directly in competition with each other.

It is alleged in the complaint that the Union Pacific on or about July 1, 1929, purchased all of the outstanding stock of the Interstate Transit Lines, a previously independent company, and obligated itself to purchase additional stock to an amount exceeding \$1,000,000, in addition to obligating itself to purchase new equipment to the value of \$1,080,000, without authority from the Interstate Commerce Commission, and in violation of Section 20-A of the Interstate Commerce Act. It is further alleged that the railroad has pledged its resources as a guarantor of the obligations of the Interstate Transit Lines, a public utility, in violation of the same act and of the Transportation Act of 1920. The railroad is accused of discriminating against the Pickwick-Greyhound Lines by delivering to the Interstate Transit Lines all passengers originated by the railroad, and by using the facilities of the railroad to obtain passengers exclusively for the subsidiary motor coach line.

The commission is asked to enter an order requiring the Union Pacific to desist from the alleged unlawful acts, and to take such action as will result in the issuance of an injunction against the Union Pacific restraining it from the alleged illegal practices.

The charges made in the complaint are abstracted below:

Text of Complaint

The Union Pacific Railroad Company operates a system of steam railroads, subject to the interstate commerce act, west of the Missouri River from Omaha, Neb., and Kansas City, Mo. The Interstate Transit Lines is a corporation organized under the laws of the state of Nebraska operating as a passenger motor carrier on the public highways, west of Chicago and St. Louis, Mo., in interstate and intrastate commerce. All of the stock of the Interstate Transit Lines, except qualifying directors' shares, is held and owned by the Union Pacific.

The lines of the complainants and the defendants are competitive. Prior to on or about the first day of July, 1929, the Union Pacific owned no interest in the Interstate Transit Lines, but the same was owned and controlled by R. J. Walsh of Omaha, Neb., and operated in the state of Nebraska and adjoining states and in competition with the Union Pacific. Prior to said date, the complainants operated as passenger motor carriers in the territory they now serve west of Chicago and St. Louis, and west of Omaha and Kansas City, Mo.

On or about the first day of July, 1929, the Union Pacific purchased all of the outstanding stock of the Interstate Tran-

sit Lines and assumed the obligations of the operation of the same. The Union Pacific on or about said date further obligated itself to purchase stock of the Interstate Transit Lines additional to that outstanding, and to the full amount of the authorization provided by the charter of said Interstate Transit Lines in an aggregate amount exceeding \$1,000,000. The Union Pacific at said time contracted and obligated itself for the purchase of \$1,080,000 of new equipment for the Interstate Transit Lines. The total resources of the Union Pacific, consisting of assets in excess of \$1,000,000,000 have been pledged to and placed at the disposal of the Interstate Transit Lines for the development of motor carrier service on the public highways. By reason hereof the Union Pacific has assumed obligations and liabilities in respect to the securities of the Interstate Transit Lines without application to, or order of, the Interstate Commission, and in violation of Section 20-A of the Interstate Commerce Act; and the Union Pacific has pledged its resources as a guarantor of the obligations of a public utility, in violation of the Interstate Commerce Act and the Transportation Act of 1920.

[Section 20a, paragraphs (1) and (2), reads, "That as used in this section the term 'carrier' means a common carrier by railroad (except a street, suburban, or interurban electric railway which is not operated as a part of a general steam railroad system of transportation) which is subject to this Act, or any corporation organized for the purpose of engaging in transportation by railroad subject to this Act.

From and after one hundred and twenty days after this section takes effect, it shall be unlawful for any carrier to issue any share of capital stock or any bond or other evidence of interest in or indebtedness of the carrier (hereinafter in this section collectively termed 'securities') or to assume any obligation or liability as lessor, lessee, guarantor, indorser, surety, or otherwise, in respect of the securities of any other person, natural or artificial, even though permitted by the authority creating the carrier corporation, unless and until, and then only to the extent that, upon application by the carrier, and after investigation by the Commission of the purposes and uses of the proposed issue and the proceeds thereof, or of the proposed assumption of obligation or liability in respect of the securities of any other person, natural or artificial, the Commission by order authorizes such issue or assumption. The Commission shall make such order only if it finds that such issue or assumption: (a) is for some lawful object within its corporate purposes, and compatible with the public interest, which is necessary or appropriate for, or consistent with the proper performance by the carrier of service to the public as a common carrier, and which will not impair its ability to perform that service, and (b) is reasonably necessary and appropriate for such purpose."—EDITOR.]

Lines Extended

Subsequent to the acquisition of the Interstate Transit Lines by the Union Pacific, the Interstate Transit Lines and, through the Interstate Transit Lines, the Union Pacific, proceeded to and did extend the lines of the Union Pacific from Kansas City east to St. Louis and from Omaha to Chicago, in a territory not theretofore served by the Interstate Transit Lines or the Union Pacific, and without a certificate of convenience and necessity as required by paragraph 18 of section 1 of the Interstate Commerce Act and in violation of said act and of the Transportation Act of 1920.

[Paragraph 18 of section 1 reads, "After ninety days after this paragraph takes effect no carrier by railroad subject to this Act shall undertake the extension of its line of railroad, or the construction of a new line of railroad, or shall acquire or operate any line of railroad or extension thereof, or shall engage in transportation under this Act over or by means of such additional or extended line of railroad, unless and until there shall first have been obtained from the Commission a certificate that the present or future public convenience and necessity require or will require the construction, or operation, or construction and operation, of such additional or extended line of railroad, and no carrier by railroad subject to this Act shall abandon all or any portion of a line of railroad, or the operation thereof, unless and until there shall first have been obtained from the Commission a certificate that the present or future public convenience and necessity permit of such abandonment."—EDITOR.]

The Union Pacific, through the Interstate Transit Lines, charges, demands, collects and receives different compensation for transportation of passengers, and service in connection therewith, between the points named in the tariff of the Union Pacific on file with the Interstate Commerce Commission, in accordance with the requirements of the Interstate Commerce Act, than the rates, fares and charges which are specified in said tariff; and said Union Pacific, through said

Interstate Transit Lines, refunds and remits a portion of the rates, fares and charges so filed, and extends to persons privileges and facilities in the transportation of passengers which are not specified in its filed tariffs; all in violation of paragraph 7 of section 6 and section 22 of the Interstate Commerce Act.

[Paragraph 7 of section 6 reads, "No carrier, unless otherwise provided by this Act, shall engage or participate in the transportation of passengers or property, as defined in this Act, unless the rates, fares, and charges upon which the same are transported by said carrier have been filed and published in accordance with the provisions of this Act; nor shall any carrier charge or demand or collect or receive a greater or less or different compensation for such transportation of passengers or property, or for any service in connection therewith, between the points named in such tariffs than the rates, fares, and charges, which are specified in the tariff filed and in effect at the time; nor shall any carrier refund or remit in any manner or by any device any portion of the rates, fares, and charges so specified, nor extend to any shipper or person any privileges or facilities in the transportation of passengers or property, except such as are specified in such tariffs."

Section 22, paragraph 1, reads in part, "But before any common carrier, subject to the provisions of this Act, shall issue such joint interchangeable mileage tickets with special privileges, as aforesaid, it shall file with the Interstate Commerce Commission copies of the joint tariffs of rates, fares or charges, on which such joint interchangeable mileage tickets are to be based, together with specifications of the amount of free baggage permitted to be carried under such tickets, in the same manner as common carriers are required to do with regard to other joint rates by section 6 of this Act, and all the provisions of said section 6 relating to joint rates, fares and charges, shall be observed by said common carriers and enforced by the Interstate Commerce Commission as fully with regard to such joint interchangeable mileage tickets as with regard to other joint rates, fares and charges referred to in said section 6. It shall be unlawful for any common carrier that has issued or authorized to be issued any such joint interchangeable mileage tickets to demand, collect, or receive from any person or persons a greater or less compensation for transportation of persons or baggage under such joint interchangeable mileage tickets than that required by the rate, fare, or charge specified in the copies of the joint tariff of rates, fares or charges filed with the Commission in force at the time. The provisions of section ten of this Act shall apply to any violation of the requirements of this proviso."—EDITOR.]

Less Than Rail Rates Charged

The Union Pacific, acting through the Interstate Transit Lines, demands, collects and receives, for the service rendered in transportation of passengers, less compensation than it charges, demands, collects or receives from persons given a like or contemporaneous service on the steam lines of the Union Pacific, in violation of section 2 of the Interstate Commerce Act.

[Section 2 reads, "That if any common carrier subject to the provisions of this Act shall, directly or indirectly, by any special rate, rebate, drawback, or other device, charge, demand, collect, or receive from any person or persons a greater or less compensation for any service rendered, or to be rendered in the transportation of passengers or property or the transmission of intelligence, subject to the provisions of this Act, than it charges, demands, collects, or receives from any other person or persons for doing for him or them a like or contemporaneous service in the transportation or transmission of a like kind of traffic or message under substantially similar circumstances and conditions, such common carrier shall be deemed guilty of unjust discrimination, which is hereby prohibited and declared to be unlawful."—EDITOR.]

The Union Pacific, acting through the Interstate Transit Lines, gives to certain persons, firms, companies, corporations and localities undue and unreasonable preference and advantage, in that it renders a service different and at less compensation than to other persons, firms, companies, corporations and localities on the lines of the Union Pacific, and subjects persons, companies, firms, corporations and localities to undue and unreasonable prejudice and disadvantage, in violation of section 3 of the Interstate Commerce Act.

[Section 3, paragraph 1, reads, "That it shall be unlawful for any common carrier subject to the provisions of this Act to make or give any undue or unreasonable preference or advantage to any particular person, company, firm, corporation, or locality, or any particular description of traffic, in any respect whatsoever, or to subject any particular person, company, firm, corporation or locality or any particular description or traffic, to any undue or unreasonable prejudice or disadvantage in any respect whatsoever."—EDITOR.]

The Union Pacific fails to afford to the lines of the complainants herein and motor carriers, other than the Interstate Transit Lines, reasonable, proper and equal facilities for the interchange of traffic and for the receiving, forwarding and delivering of passengers, and discriminates against complainants in that it delivers to the Interstate Transit Lines, all passengers originated by the Union Pacific, and uses the facilities of such railroad company to obtain traffic and passengers exclusively for the Interstate Transit Lines, in violation of paragraph 3 of section 3 of the Interstate Commerce Act.

[Paragraph 3, section 3, reads, "All carriers, engaged in the transportation of passengers or property, subject to the provisions of this Act, shall, according to their respective powers, afford all reasonable, proper and equal facilities for the interchange of traffic between their respective lines, and for the receiving, forwarding and delivering of passengers or property to and from their several lines and those connecting therewith, and shall not discriminate in their rates, fares and charges between such connecting lines, or unduly prejudice any such connecting lines in the distribution of traffic that is not specifically routed by the shipper."—EDITOR.]

The Union Pacific charges and receives a greater compensation in the aggregate for the transportation of passengers for a shorter than for a longer distance over the same route in the same direction, the shorter being included within the longer distance, and charges greater compensation as a through rate than the aggregate of the intermediate rates, no authority being given by the Interstate Commerce Commission so to do, all in violation of section 4 of the Interstate Commerce Act; such violation being herein alleged by reason of the fact that the Interstate Transit Lines operate over the same route in the same direction as the Union Pacific, and at less and different rates of fares and charges.

[Section 4, paragraph 1, reads in part, "That it shall be unlawful for any common carrier subject to the provisions of this Act, to charge or receive any greater compensation in the aggregate for the transportation of passengers, or of like kind of property, for a shorter than for a longer distance over the same line or route in the same direction, the shorter being included within the longer distance, or to charge any greater compensation as a through rate than the aggregate of the intermediate rates subject to the provisions of this Act, but this shall not be construed as authorizing any common carrier within the terms of this Act to charge or receive as great compensation for a shorter as for a longer distance."—EDITOR.]

The Union Pacific, acting through the Interstate Transit Lines, by rendering service and transporting passengers for less compensation than it does on the lines of the Union Pacific, in steam passenger trains, causes an undue and unreasonable advantage, preference and prejudice as between persons and localities in intrastate commerce on the one hand, and interstate commerce on the other, and causes undue, unreasonable and unjust discrimination against interstate commerce, in violation of section 13 of the Interstate Commerce Act, and of the Transportation Act of 1920.

[Paragraph 4 of section 13 reads, "Whenever in any such investigation, the Commission, after full hearing, finds that any such rate, fare, charge, classification, regulation, or practice causes any undue or unreasonable advantage, preference or prejudice as between persons or localities in intrastate commerce on the one hand, and interstate or foreign commerce on the other hand, or any undue, unreasonable, or unjust discrimination against interstate or foreign commerce which is hereby forbidden and declared to be unlawful, it shall prescribe the rate, fare, or charge, or the maximum or minimum, or maximum and minimum, thereafter to be charged, and the classification, regulation, or practice thereafter, to be observed, in such manner as, in its judgment, will remove such advantage, preference, prejudice, or discrimination. Such rates, fares, charges, classifications, regulations, and practices shall be observed while in effect by the carriers parties to such proceeding affected thereby, the law of any State or the decision or order of any State authority to the contrary notwithstanding."—EDITOR.]

Interstate Lines Part of Rail System

The allegations of the last seven paragraphs above are grounded upon the fact that the Union Pacific purchased, owns, controls and operates the Interstate Transit Lines as a part of its railroad system, using the same to compete with itself and with complainant's lines, and other motor carriers and common carriers, both in the territory served by the Union Pacific and in the territory served by other common carriers, contrary to the provisions of the Interstate Commerce Act heretofore cited as well as in derogation of sections 5 and 15-a of said act.

[Section 5 reads in part, "That, except upon specific approval by order of the Commission as in this section provided, and except as provided in paragraph (16) of section 1 of this Act, it shall be unlawful for any common carrier subject to this Act to enter into any contract, agreement, or combination with any other common carrier or carriers for the pooling of freights or different and competing railroads, or to divide between them the aggregate or net proceeds of the earnings of such railroads, or any portion thereof; and in any case of an agreement for the pooling of freights as aforesaid each day of its continuance shall be deemed a separate offense."—EDITOR.]

The officers and directors of the Interstate Transit Lines, with the exception of R. J. Walsh, are officers and directors of the Union Pacific and hold such positions with the Interstate Transit Lines, without authorization by order of the Interstate Commerce Commission, in violation of section 20-a of the Interstate Commerce Act and of the Transportation Act of 1920, and of the laws of the United States.

[Paragraph 12 reads, "After December 31, 1921, it shall be unlawful for any person to hold the position of officer or director of more than one carrier, unless such holding shall have been authorized by order of the Commission, upon due showing, in form and manner prescribed by the Commission, that neither public nor private interests will be adversely affected thereby. After this section takes effect it shall be unlawful for any officer or director of any carrier to receive for his own benefit, directly or indirectly, any money or thing of value in respect to the negotiation, hypothecation, or sale of any securities issued or to be issued by such carrier, or to share in any of the proceeds thereof, or to participate in the making or paying of any dividends of an operating carrier from any funds properly included in capital account. Any violation of these provisions shall be a misdemeanor, and on conviction in any United States court having jurisdiction shall be punished by a fine or not less than \$1,000 nor more than \$10,000, or by imprisonment for not less than one year nor more than three years, or by both such fine and imprisonment, in the discretion of the court."—EDITOR.]

The obligation of the assets and revenues of the Union Pacific to and for the benefit of the Interstate Transit Lines,

and the operation of the Interstate Transit Lines tend to impair the revenues of the Union Pacific and to affect its earnings under just and reasonable rates, and tend to make such just and reasonable rates unreasonable, and to prejudice the interests of shippers and of the public and of the United States, contrary to the provisions of section 15-a of the Interstate Commerce Act and of the Transportation Act of 1920.

[Paragraph 5 of section 15a reads, "Inasmuch as it is impossible (without regulation and control in the interest of the commerce of the United States considered as a whole) to establish uniform rates upon competitive traffic which will adequately sustain all the carriers which are engaged in such traffic and which are indispensable to the communities to which they render the service of transportation, without enabling some of such carriers to receive a net railway operating income substantially and unreasonably in excess of a fair return upon the value of their railway property held for and used in the service of transportation, it is hereby declared that any carrier which receives such an income so in excess of a fair return, shall hold such part of the excess, as hereinafter prescribed, as trustee for, and shall pay it to, the United States."—Editor.]

It was and is the purpose and intent of the Union Pacific, in using its assets and revenues to acquire and operate the Interstate Transit Lines, to lessen competition between said corporations and to use the resources of the Union Pacific to so compete with complainants as to impair their revenues and cause them such losses as will compel them to withdraw from competition with the Union Pacific and the Interstate Transit Lines, and thereby monopolize to the Union Pacific the transportation of passengers in the territory served by it and restrain commerce in the sections, communities and territory served by it, all in violation of the Interstate Commerce Act, the Transportation Act of 1920 and the laws of the United States.

A Similar Case

A somewhat similar complaint was made to the Interstate Commerce Commission last year, under Docket No. 16552. In that complaint, A. Jaloff, proprietor of the Columbia Stages, complained that the Spokane, Portland & Seattle, by the organization of its motor coach operating subsidiary, the S. P. & S. Transportation Company, had violated provisions of the Interstate Commerce Act, including paragraph 18 of section 1 of the act, relating to the obtaining of a certificate of public convenience and necessity, and of section 15-a of the act relating to the recapture by the government of the excess earnings of common carriers. The complainant contended that the railway, by engaging in the motor coach business, in effect, had extended its line without having first obtained a certificate of public convenience and necessity, as defined by paragraph 18 of section 1. The other complaint was that the investment of the railway company's funds in the transportation company, and advances made to the latter by the railway without first obtaining the authority of the commission, was a diversion of railway company's funds contrary to the provisions of section 15-a relating to the recapture of excess earnings.

Attorney Examiner Leo J. Flynn, of the commission, recommended a finding that the charges had not been

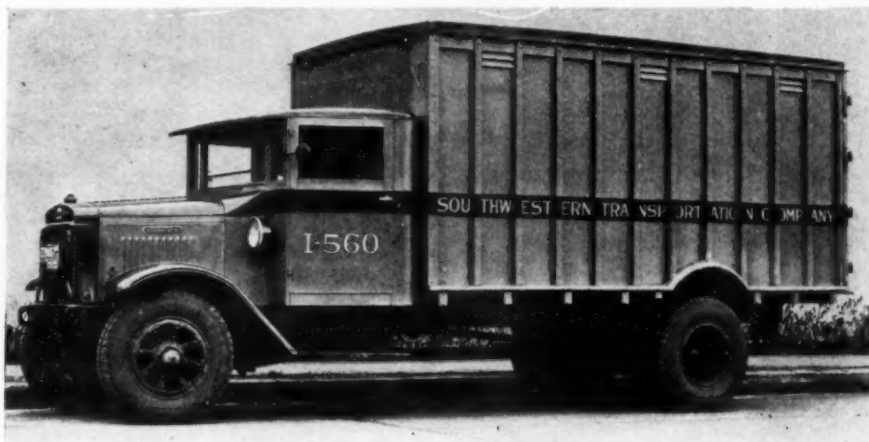
sustained, and this proposed report was approved by the commission. Regarding the "extension of line" contention, Examiner Flynn said that in Tariffs Embracing Motor Truck or Wagon Transfer Service, 91 ICC 539, the commission had found that its jurisdiction did not cover truck service which extended beyond terminal districts and became what was commonly designated as a line-haul, and which might in effect act as an extension of the lines of a rail or water carrier. He said that in the present state of the law, the railway company would not be required to obtain a certificate of convenience and necessity before it commenced the operation of a motor coach line through a subsidiary.

With respect to the other complaint, Examiner Flynn reported that the investment of the railway company's funds in the stock of the transportation company, and loans made to the latter, were charged on the railway company's books to the account of investments in affiliated companies. No charge, he said, had been made to railway operating expenses by reason of the advances made to the transportation company. It did not appear that the books of the railway company were not kept in compliance with the commission's accounting regulations, and the records, according to Examiner Flynn, did not disclose a violation of the recapture provision.

The only criticism of Examiner Flynn had to do with the selling of tickets that might be used on either motor coaches or railway trains. He said there was no reference in the railway traffic to the transportation company's service, nor did the evidence show the allowances made to the transportation company for any service rendered by it to passengers traveling on tickets sold by the railway company. He said that if the allowance were such that the amount accruing to the railway company for the actual rail service rendered by it, independent of any transportation by the motor coach line, was less than the published fare for such rail transportation, there was a violation of the act. According to Examiner Flynn, the law requires that all charges for transportation, subject to the Interstate Commerce Act, be filed and that such charges be collected without deviation. Charges for service subject to the act have to be collected and retained entirely by the railway company, and it is not in compliance with section 6 to publish a through fare which covers rail service by the railroad and motor coach service by the transportation company, without separately stating the charge for the rail service. The commission, Examiner Flynn said, should require carriers subject to the act, when filing tariffs which cover a combination of rail and motor coach service, to comply with the provisions of the act and tariff regulations of the commission.

* * * *

One of the Internationals in Cotton Belt Motor Truck Fleet



New Equipment

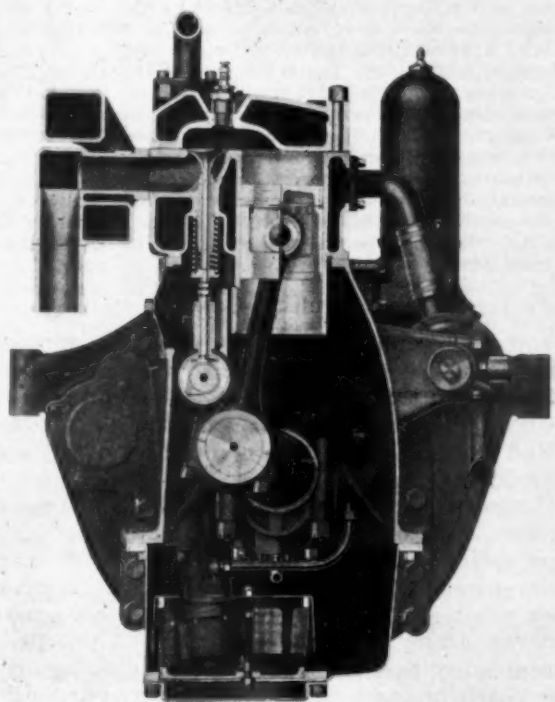
Schacht Series 25 Combines Smartness with Utility

A 3-TON truck of attractive appearance and advanced mechanical design has been announced by the Le Blond-Schacht Co., Cincinnati, O. The series 25 has the sweeping fender lines and low, well proportioned hood of a passenger car, and the radiator and lamps are chromium plated for increased attractiveness.

It is powered by a six cylinder Waukesha engine of 3¾ in. bore and 4½ in. stroke, giving a piston displacement of 298 cu. in., and develops 66 h.p. at 2200 r.p.m. Cylinders are cast in block of alloy nickel iron, and the crankshaft is supported by seven main bearings. The engine has the Ricardo type combustion chamber, which is designed to give greater power and economy and to reduce the detonating tendency of present day fuels. It is claimed that the greater turbulence produced by this head design, results in faster and more complete burning of the fuel, with a consequent increase in power and lower exhaust temperature with no exhaust valve trouble. The girder type crankcase with demountable cylinders gives a very rigid support for the crankshaft. A Zenith 1¼-in. carburetor is furnished, and ignition is by battery and distributor. Full pressure lubrication to all main bearings includes an oil filter which operates under pressure. The engine is mounted on rubber supports to dissipate road shocks and chassis strains and to insure less vibration being transmitted to the frame. An air cleaner, governor and gasoline strainer are standard equipment. The cooling system consists of a copper flat-tube-type radiator which is 4 in. deep and is practically burst proof in the event of freezing. The outer shell is one piece and chromium plated.

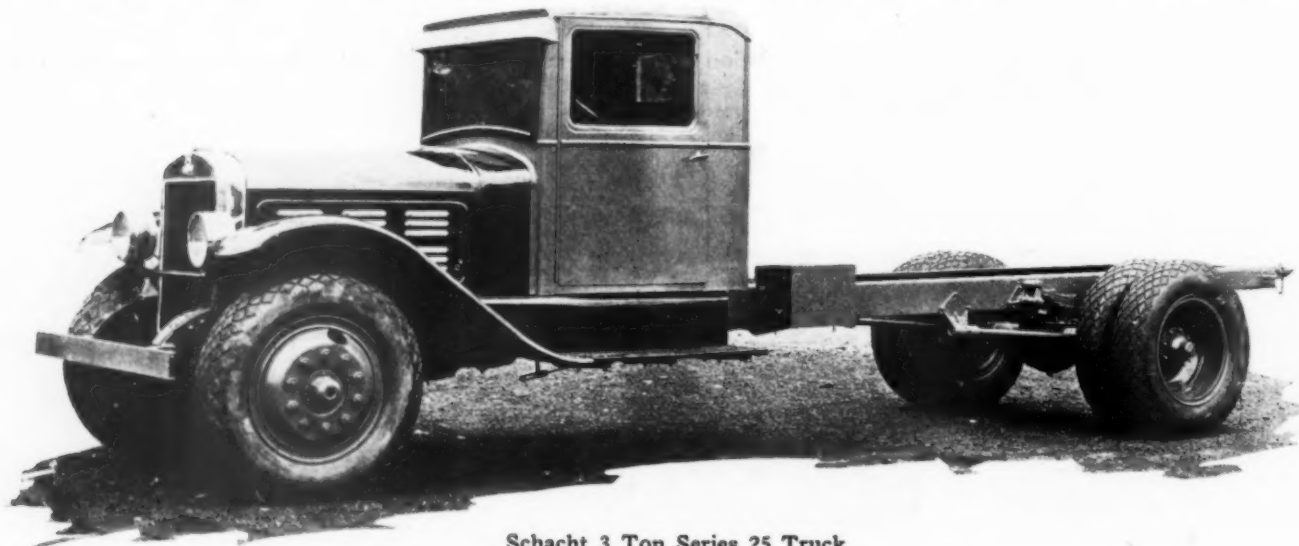
Mounted in unit with the engine is a 10 plate, dry multiple disc clutch and a Brown-Lipe, model 35, 4 speed transmission, having Timken bearings on main and countershaft. A full floating Timken spiral bevel gear drive rear axle with a standard gear ratio of 6.17 to 1 is employed. Ball and socket type, self compensat-

ing radius rods are a standard feature of this model. The front axle is an extra heavy drop forging of I-beam cross-section. The Lockheed hydraulic internal expand-



Waukesha Engine Used in New Schacht Truck

ing service brakes operate on all four wheels and are energized by a B-K vacuum booster. The hand brake is an external contracting band on the rear of the trans-



Schacht 3 Ton Series 25 Truck

mission. A cam and lever type steering gear is standard equipment.

Spicer all-metal type universal joints are used on the drive shaft.

The springs are semi-elliptic and made of high grade alloy steel with helper springs added to the rear to give extra capacity and stability. The front springs are 40 in. long, 2½ in. wide, and have 10 leaves, and the rear springs are 50 in. long, 3 in. wide and have 13 leaves. The frame is made of ¼-in. pressed steel, hot riveted, and is 7 in. deep and 3 in. wide. The gasoline tank of

18 gal. capacity is located under the driver's seat. Budd disc wheels are equipped with 32-in. by 6-in., 10 ply pneumatic tires with duals on the rear wheels.

The weight of the chassis and cab is 5500 lb., the total allowable gross weight 13,000 lb., giving a maximum carrying capacity, body and load, of 7,500 lb. Optional wheelbases of 146, 160, 174, 188 and 199 in. permit the use of various types of bodies. The truck comes equipped with full electrical equipment, front fenders, side splash plates, floor boards, temperature indicator and tire carrier.

Relay Announces Suspension Drive Motor Coach

THE Relay Motors Corporation, Lima, O., has brought out a motor coach chassis which incorporates the Relay pendulum suspension rear axle, which has previously been used only for truck application. This rear axle is of unusual construction in that it provides the effect of a horizontal spring which cushions starting and stopping shocks and also those caused by road obstructions. It is claimed that the chassis is protected from 70 per cent of the heavier horizontal impacts and 40 per cent of the heavier vertical impacts.

The construction of the Relay axle allows the weight of the chassis and load to be carried at a distance below the center of the axle, differing from the conventional type in this respect, and is so designed that the load can move in a horizontal direction around the rear axle as a center, either forward or backward depending on the direction of the impact. This movement is similar to a pendulum which is free to move forward and backward, the amount of its travel depending upon the force applied to it horizontally. The effect of this construction, according to the manufacturers, is to cushion the impacts caused by stopping and starting, and to largely prevent the horizontal factor of shocks caused by road irregularities, from reaching the chassis and load. The pendulum suspension has the effect of an additional horizontal spring.

The conventional truck wheel has a natural tendency

to bounce when it encounters an obstruction in the road, and this is increased by the use of pneumatic tires. The pendulum suspension is claimed to largely prevent this bouncing action and to allow the wheel to roll normally over an obstruction and thereby reduce the shock to the chassis and load. This freedom from bouncing also increases the life of tires.

In operation, the weight of the load and body has a tendency to keep the pinion directly below the center of the wheel, but as the pinion is turned by the engine, it has a tendency to roll upward within the ring gear until it overcomes the external driving resistance and at this point the vehicle begins to move. While the pinion is swinging upward, a pendulum force is developed which, as a maximum, approximates three times the weight of the vehicle.

The wheelbase of the motor coach chassis is 180 in. The engine has six cylinders of 3⅝ in. bore and 5 in. stroke giving 309.6 cu. in. piston displacement. The cylinder block is grey iron with a steel alloy to give greater resistance to wearing of cylinders and valve seats.

All the castings are thoroughly seasoned to eliminate internal strains. The engine is supported at three points to prevent strain on the crankcase. The oil pan is easily removed without disturbing other parts. The four bearing, drop-forged crankshaft is statically and dynamically balanced. Valve pushrods are of the



Model K B Relay Motor Coach

mushroom type, hardened and ground to a close fit and all valve parts are fully enclosed. A force feed oiling system delivers oil to the connecting rod bearings and to the timing gear compartment.

Battery ignition is furnished with semi-automatic control. The carburetor has a double venturi with a pump to take care of acceleration. The cooling water is circulated by a centrifugal pump which can be removed as a unit. A large four blade fan is driven by a vee belt, and the radiator is cushioned by rubber fabric and springs. The clutch is of the multiple disc type and the sliding gear type transmission has four speeds forward and one reverse. The I-beam front axle has been especially designed for front wheel brakes. The rear axle is of Relay design with a spiral lever differential drive at the center and a track gear and pinion in the wheels, giving a double reduction type of drive. The wheels are supported by two bearings which absorb the end thrust independent of the differential. All gears and shafts are made of chrome nickel steel and the standard gear ratio is 5.14 to 1. Tubular radius rods rigidly support the rear axle.

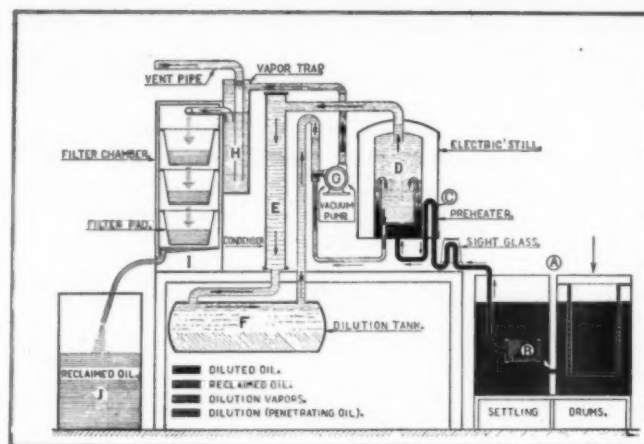
Two sets of independently operated brakes are a part of the design, consisting of a hydraulic, internal expanding service brake operating on all four wheels and a hand operated emergency brake operating on the drive shaft. An irreversible screw and lever type steering gear with an 18 in. hand wheel is insulated from vibration by a rubber cushion-type support.

The frame is made of pressed steel, hot riveted and amply reinforced by cross members and gusset plates. It is 7 in. deep by 2¼ in. wide and ¼ in. thick, and is arched over both front and rear axles.

Well ventilated, steel disc wheels are standard equipment, and are fitted with 32 in. by 6 in. pneumatic tires, single front and dual rear. A 30 gal. gasoline tank is located on the side of the frame, and a vacuum tank is used to bring the fuel to the carburetor. A complete electrical system is furnished which has a voltage regulated generator and headlights of the depressed beam type. Other equipment regularly furnished includes a speedometer, front fenders, front and rear bumper and heater valve.

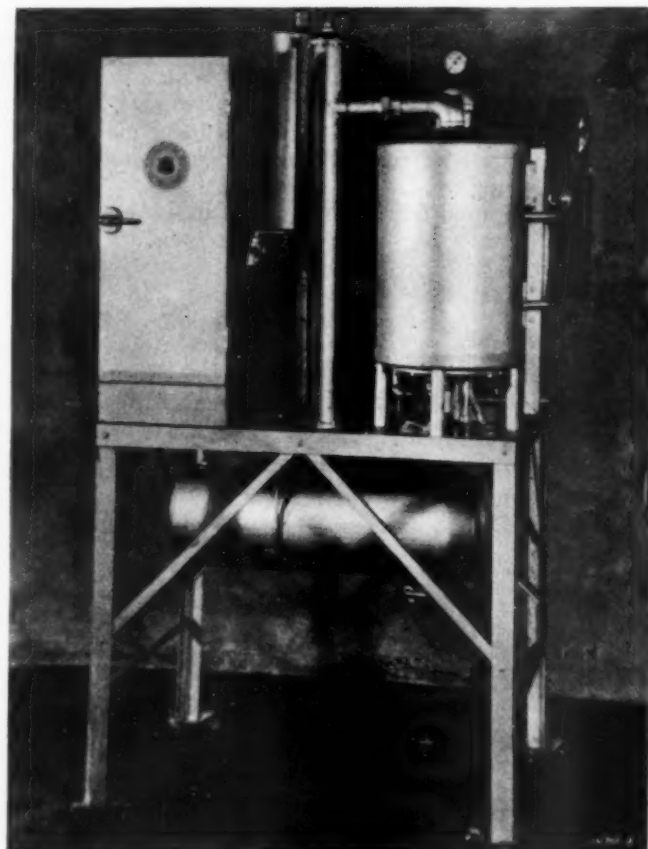
Skinner Develops New Junior Oil Reclaimer

THE Skinner Automotive Device Company, Detroit, Mich., has brought out an oil reclaimer which has been particularly designed for the smaller fleet owner. It is a counterpart of this company's senior model oil reclaimer, but of smaller dimensions and less capacity. The machine is electrically operated and fully automatic, requiring a minimum of attention. When operated continuously, it has a capacity of 2¼-gal. of refined oil per hour, consuming about 2.2 k.w. The cost of reclaiming a gallon of oil including electric current, labor and filter replacements, is said to be not over 11 cents per gal. The process of operation is shown in the illustration. Crankcase drainage is first permitted to settle in the two settling drums "A," allowing much of the water and heavy solid matter to be separated out, thereby prolonging the life of the filters. The reclaimer operates under a high vacuum, reducing the temperature required to distill off gasoline and all



Diagrammatic View of the Operation of the Skinner Oil Reclaimer

liquid impurities. When the oil in the electric still, "D," reaches the proper temperature, this vacuum draws in a continuous supply of used oil from the settling drums. The incoming oil first passes through a strainer "B," thence through a preheater "C," where it is warmed before entering the still "D," through an automatic control valve. The oil then passes upward along the electrically heated surface in the still "D," and is brought up to the proper temperature to drive off all liquid impurities, which in vapor form enter the condenser "E," and the condensed liquid is collected in dilution tank "F," below the machine. Free from liquid impurities, the oil passes into the cup baffle in the still and is drawn through outlet pipe directly into the vacuum pump "G." From this point it is delivered to the vapor separating tank "H." Here, any vapors



Skinner Oil Reclaimer, Junior Model

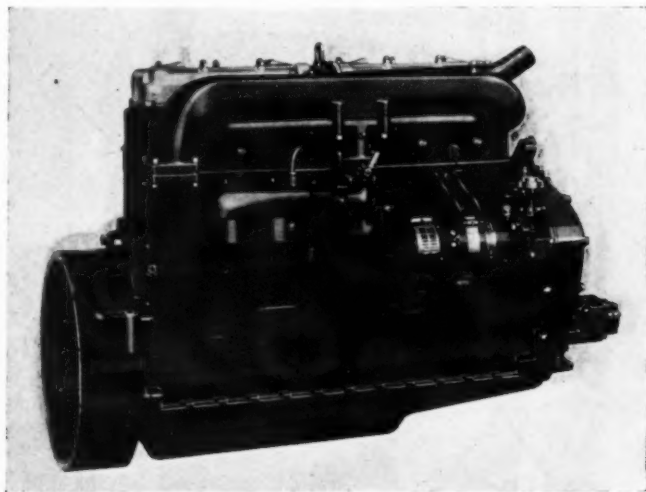
entrained with the oil are trapped in the tank by an oil seal and are then piped to the outside of the building.

Leaving the vapor separating tank, the oil enters the filter chamber "I," and passes through a series of gravity filters which remove the finest particles of dirt and abrasive. The reclaimed oil now drains by gravity into the storage drum "J," again ready for use in the motor.

The drainage thus collected in the dilution tank "F" is a super-penetrating oil and can be readily used on springs and other part of the chassis, making it unnecessary to purchase any oil of this type. The oil recovered is said to be a clear full-bodied product in every respect of high quality. Operators who have used the equipment report a reduction of 50 per cent in their oil consumption. The advantages claimed in using this system are: Engine wear is decreased, since the crankcase can be drained frequently and refilled with pure oil at little expense, and lubrication costs are reduced, since waste is eliminated and the same oil kept in service indefinitely.

Continental Presents High Powered Engine

THE latest engineering development in the motor coach field, of the Continental Motors Corporation, Detroit, is a six-cylinder, 150-horsepower, overhead valve type engine, the design of which has been based upon a careful analysis of modern requirements of motor coach power plants. The important fea-



Right Side View of Continental Model 20-Z Engine

ture is the large piston displacement of 779.3 cu. in. The model 20-Z has a bore of 5¼ in. and a stroke of 6 in. and incorporates an overhead valve system with a detachable head. This nickel-iron head carries the rockershaft and the valve mechanism, and has ample air passages around the valves and spark plugs. The cylinders contain removable sleeves of nickel iron, which, from a service standpoint, are a desirable feature as they can be easily and quickly replaced.

The nickel iron pistons have five rings and the piston pins are held in place by rings fitted in grooves at each end of the pin. Pin bearings are phosphor bronze. The

gray iron crankcase is cast integral with the cylinder block, and the lower oil pan is of aluminum. The semi-steel flywheel is designed to accommodate a multiple disc or an 18-in. plate clutch.

The crankshaft is supported by seven main bearings 3¼ in. in diameter, which are of the bronze backed type, fitted with dowel pins. End thrust is taken by the front main bearing. The connecting rod lower end bearings are permanently spun in place. Intake and exhaust manifolds, located on the right side of the motor, are cast in separate units, but are bolted together at the center for the purpose of warming the incoming gas mixture. The exhaust manifold flange will accommodate a 3½ in. diameter exhaust pipe.

A centrifugal water pump, driven by the accessory shaft, runs at 1½ times crankshaft speed and is readily removable. Pressure feed lubrication to crankshaft bearings, connecting rod bearings, camshaft bearings, valve mechanism, accessory drive and timing chain is provided by a gear-driven oil pump operating on the camshaft. An oil pressure adjustment is located on the right hand side of the crankcase.

Either magneto or distributor ignition systems can be used, and provision is made in the cylinder head design for two sets of spark plugs. Starting motor and generator are mounted on the right hand side of the engine in an accessible position. Mountings are provided for a governor and an air cleaner. The front end drive is by silent chain, 3 in. wide by ¾ in. pitch, which has an automatic take-up idler provided with extra large adjustment. The engine is suspended at three points.

Two other coach engines incorporating similar features of design will be announced shortly by Continental, the 16-Z of 4¾ in. bore and 6 in. stroke and the 17-Z with 5 in. bore and 6 in. stroke.

Ingersoll-Rand Announces Air Cooled Air Compressor

A LINE of compact, self-contained air compressors, designed to give satisfactory service day after day with a minimum of attention, has been developed by the Ingersoll-Rand Company, New York. The new Type 30 compressor is air cooled, eliminating all water connections, and has two stages of compression, which insures a cooler discharge air and prevents valve-sticking as a result of carbon deposits. No special

The Type 30 Compressor

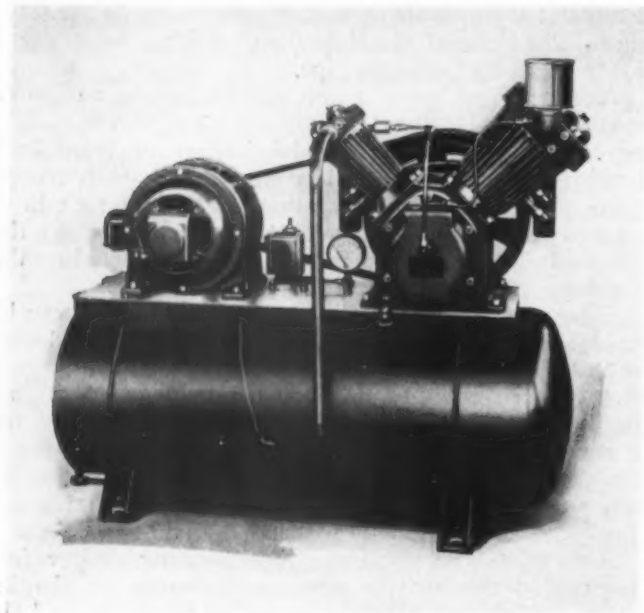
| | | | | |
|---|-------|-------|-------|-------|
| Piston Displacement, Cu. Ft. per Min..... | 3.25 | 6.5 | 12.0 | 19.9 |
| Bore of Low-Pressure Cylinder, in..... | 3 | 3 | 4 | 5 |
| Bore of High-Pressure Cylinder, in..... | 1¾ | 1¾ | 2½ | 3 |
| Stroke, in. | 2 | 2 | 2¾ | 3½ |
| Horsepower | ¾ | 1½ | 3 | 5 |
| Revolutions per minute of compressor..... | 400 | 800 | 600 | 500 |
| Size of Air Receiver, in. | 16x40 | 16x40 | 16x40 | 18x48 |

foundation is necessary, the installation being complete when the electrical connections to the motor have been made. The units are self-contained, the motor and compressor being mounted on a steel base which is attached to the top of the air receiver.

These machines are said to be fully automatic under all conditions. Even if the compressor should shut down because of line voltage failure, it will stop in an unloaded condition, thus protecting the motor from

burning out when the voltage comes on again. This is accomplished by an automatic unloading device operated by a centrifugal governor on the crank-shaft. When the compressor stops, the air remaining in the high-pressure cylinder and intercooler is exhausted automatically through a relief valve.

Both high and low pressure cylinders have deep radiating fins on both the sides and heads, and are cooled by a fan type flywheel. The intercooler is also located directly behind the fan so that a constant current of cir-



Type 30 Ingersoll-Rand Air Compressor

culating air is driven directly across the cooling coils, which effectively reduces the temperature of the discharge air.

The compressor is driven by a noiseless V-belt which requires no extra idler attachment. The balanced crank-shaft is mounted on annular-type ball-bearings, which require no adjustment, and a felt packing ring prevents oil from working out of the crankcase on to the drive belt. Splash oiling is provided and a bayonet gage indicates the amount of oil in the crank-case. A catch basin for dirt and grit, with a drain plug, forms a part of the base. Honed cylinders and two oil control rings on the pistons reduce the oil in the discharge air to a minimum. Each piston is run into its respective cylinder when assembled, to insure a perfect oil seal.

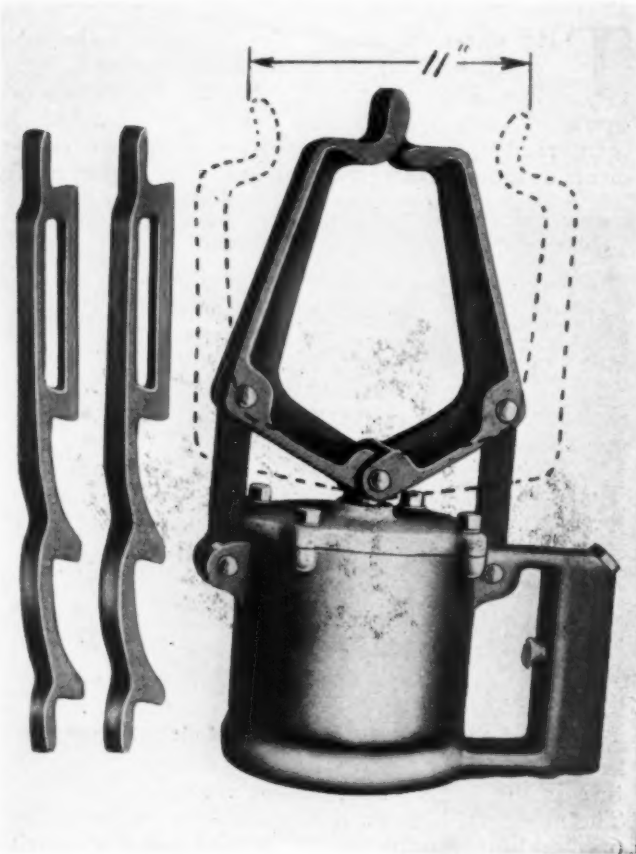
The Ingersoll-Rand plate valves used are of the same general type as those used in the larger industrial compressors. The valve itself is a flat plate of thin cross-section to reduce the inertia effect, and is held on its seat by a flat spring, its movement being limited by a stop plate. A self-clearing air cleaner keeps dirt out of the compressor, and is said to require no attention. The compressor is entirely enclosed and no dirt can get into it to cause premature wear.

The air receiver is made of heavy pressed steel and is built to withstand a working pressure of 200 lbs per sq. in. An automatic start and stop control can be set to give working pressures up to 200 lbs. per sq. in. A ball bearing motor, of adequate capacity to run the compressor, is provided. Four sizes of the type 30 are available, their respective piston displacements being 3.25, 6.5, 12.0 and 19.9 cu. ft. per minute.

Manley Air-Operated Tire Inspection Tool

A PORTABLE tire-inspection tool, operated by air, especially designed for use in inspecting heavy-duty truck and motor coach tires, has been placed on the market by the Manley Manufacturing Company, Bridgeport, Conn. In addition to inspection work, it can be used for putting in tubes, inserting the flap and opening tires for repair work. Due to the light-weight construction, it is not necessary to lift the tire from the floor to use this tool. The spreading arms will open the tire to 11 in., and if it is desired to hold it open, the holding irons which are furnished with the tool can be inserted. A small button control valve is located in the handle which, when pressed, allows the air to flow into the cylinder, causing the arms to open. When the valve is released, the supply is shut off, the air is allowed to exhaust and a spiral spring located within the cylinder returns the arms to the closed position. The air hose is connected to the tool by a $\frac{1}{4}$ in. pipe thread and is placed where it will not interfere with the operation of the tool.

When a tire is to be inspected, the spreader arms of the tool are inserted between the beads of the tire, and when the control button is pressed the tire is opened



Tire Tool with Holding Irons

instantly. For inserting tubes, the machine is said to be especially convenient. The tube is inserted between the arms and then the tool is placed within the tire. A press of the button opens it and the tube falls into place. The tool weighs $13\frac{1}{2}$ lb. and operates on 110 lb. or more of air.

Every-Day Problems

of Motor Coach and
Truck Operation



This Month's New Questions

Question No. 16

Obtaining Competent Mechanics

"Are you able to secure competent mechanics who can be depended upon to turn out the high grade work demanded in motor coach maintenance? Do you train these men yourself, or is previous experience demanded and found adequate? If you train them yourself, of what does the course of training consist? What kinds of previous training and experience have been found most useful? What has been your experience with mechanics fresh out of automobile schools? Does their training help them to become good mechanics?"

Question No. 17

Locating and Operating Coach Terminals

"In deciding upon the location of your motor coach terminals, what points are considered essential? What facilities are provided in such stations? Can a motor coach station be made to support itself; if so, how? What is the method of supervision and how many employees are required? Is it considered better to own and operate your own stations, or, where possible, to establish a joint station with another line? What has been your experience with Union Motor Coach Terminals where a terminal company rents its facilities to a number of lines?"

What Is Your Answer?

Reply to Question No. 12

Purchase and Storage of Gasoline

"What are the respective advantages of the purchase and storage of gasoline in large or small quantities? Does the saving in the cost of gasoline purchased in large lots more than offset the losses encountered in

handling such quantities? What prices are now being paid for gasoline purchased in various quantities? Is gasoline ordered on specification, or, by ordinary brands?"

Buys In Carload Lots

It has been the policy and practice of our company to purchase our gasoline in carload lots, which effects a large saving. Our gasoline is unloaded by electrical pumps which require practically no attention. After the lines are hooked up to the car and the pump is

started, there is no need for any attention until the car is empty. This gasoline is measured through a flow-type meter as it passes into our storage tanks.

Delivery of our gasoline into our coaches is through an electrical pump, which also measures the amount of gasoline put into each motor coach. Prices paid for gasoline are the prevailing market price at refineries, plus freight and store expense. All gasoline is purchased as per our specifications, and inspection made is at the refinery by our fuel inspector.

H. P. McDONALD,
Superintendent of Automotive Equipment,
Missouri Pacific Transportation Co.

Replies to Question No. 13

How Much Work from Coach Drivers?

"What mileage per day are the railway motor coach operating companies obtaining from their drivers? What is considered a good average daily mileage for drivers, and what is the general opinion as to the maximum number of miles which a driver can make in one day without loss of efficiency? Are drivers paid by the day or by the mile?"

Average 200 Miles Per Day

In a system covering over 2,500 miles of highway, a great many conditions determine the amount of mileage obtained from drivers, such as feeder lines where service is infrequent and the spread of hours is greater than on through main line runs. We have a few runs on which the mileage is as low as 90 miles per day, while the main line runs will average about 220 miles per day.

The distance a driver may safely run per day will, of course, vary with conditions on the road he travels. If operating in a congested district where he is confronted with continual heavy traffic and schedule speeds are necessarily low, he cannot be expected to drive as far as a man who operates on little used highways at greater schedule speeds. We have some runs through sparsely settled territory where drivers are required to make as high as 240 miles per day, but the average of all runs would be in the neighborhood of 200 miles per day.

Drivers are paid by the day, but the basis of the rate structure is the distance traveled, other variables taken into consideration being the road conditions, schedule speeds allowed, and whether the run operated requires the man to maintain sleeping quarters away from home. Our runs will average approximately 3.7 cents per mile.

H. R. LEIGH,
General Superintendent, Union Pacific Stages.

Basic Day 9 Hours, or 150 Miles

The length of the route and the nature of the schedule determine the average miles per day which can be obtained from a motor coach operator. On our long haul routes, we get about 160 miles per day, while on our shorter routes about 90 miles per day, with an average of 125 miles per day. A good average daily mileage is 160 miles per day, within 10 hours.

As to the maximum number of miles which a driver can make in one day without loss of efficiency, our best judgment is that it would be the mileage he could make in 10 hours with a chance to eat and rest in the middle of the day. This lay-off period ought to be 45 minutes or an hour. In the state of Massachusetts, the law does not admit of the driver of a commercial vehicle driving more than 10 hours in a period of 16 consecutive hours.

The number of miles that a man could make for a day's work would depend on the maximum speed he is allowed by law to make with the vehicle. In some states the maximum speed is 25 m.p.h., while in other states it is 45 miles an hour. The maximum speed allowed in New York state is 30 m.p.h.; in Connecticut, 35 m.p.h.; and in Rhode Island, 35 m.p.h.; while in Massachusetts, the law states that any speed over 20 miles an hour is "prima facie unreasonable."

Assuming that the vehicle is driven at an average rate of speed of 25 miles an hour, in 10 hours the operator would drive the vehicle 250 miles. It would seem to me that 10 hours behind the wheel, regardless of speed, is all that any driver ought to be asked to do for a day's work, as his efficiency would decrease materially after that number of hours behind the wheel.

Different companies pay their drivers in different ways. Some pay by the week, some by the mile, some by the day. So far as pay is concerned, our drivers are paid on the basis that 9 hours in 11 or less, and 150 miles per day or less, constitute a day's work. After 9 hours, they are paid 61½ cents per hour, and after 150 miles, they are paid 4 cents per mile—whichever is the greater.

For example, if a man drives 10 hours in 11, or 9 hours in 12, he would get one hour's overtime at 61½ cents per hour. On the other hand, if he should drive 200 miles for a day's work and perform the service in 9 hours, he would be paid a day's pay plus 50 miles at 4 cents per mile, or \$5.50 for the day's pay, plus \$2 overmileage; total, \$7.50.

F. S. HOBBS,
General Manager, New England Transportation Co.

Nature of Service Decides Question

I take it this should be considered from two standpoints, i.e.—through service and local service.

From a local service standpoint, we operate 156 miles per day. We have 18 scheduled stops and 3 flag stops on the route. Figuring six trips a day, we have to make 108 regular stops each day. Approximately 75 times during the day, the operator has to leave the coach to handle baggage. Approximately 110 times a day, he has to go through the manual labor of shifting gears, which on a large vehicle requires a lot of physical force. After running 156 miles, with a rest period sufficient only to enable the operator to get one meal, I should say at the end of the day's work, or 12 hours, to be exact, the best part of his efficiency has spent itself.

From a through service standpoint, we have had several occasions where the operator has driven 135 miles continuously, rested a few hours, and driven another 135 miles, during a stretch of 12 hours, and the operator was not fatigued. It would seem to me, therefore, that on a local run where frequent stops are made, 200 miles would be the maximum number of miles, while on a through run, the operator might easily cover 300 miles in a day without excessive fatigue.

Our operators are paid on a daily basis, the scheduled

operator's wages being based on six one way trips a day, and through or special service being based on a day's run of approximately 200 miles.

SUPERINTENDENT.

Reply to Question No. 14

Keeping Motor Coaches Clean

"What is the best practice with respect to the cleaning of motor coaches? What washing system is used, and what liquids are employed for cleaning different parts? How often are the coach exteriors cleaned? How often the chassis parts? How are the interiors cleaned, and how often? What washing equipment is provided, and how many coaches can one man take care of?"

Methods of the Reading

We find that best results are obtained in cleaning exteriors by the use of automobile soap and water, supplemented by the use of tar remover when necessary. The exterior is cleaned daily by dusting, wiping off or washing, as the case may require. At some of our garages we are using a high pressure car washing machine, and at the others use an ordinary garden hose and a soft brush.

Chassis and running gear are washed at the same time the exterior of the body is washed, using only soap and water for this operation also. The floors are swept and mopped with soap and water and the interior is dusted daily, after the coaches are brought in for the night. Nickel parts are polished with liquid metal polish weekly.

We estimate that one man can take care of cleaning the interior and exterior of from five to seven coaches per day.

This practice has been in effect practically since the start of our operations, and we are obtaining excellent results therefrom.

A. C. TOSH,

Superintendent, Reading Transportation Co.

Reply to Question No. 15

Disposing of Worn-Out Equipment

"When motor coaches have been worn out or have had to be retired from service for other reasons, what is done with them? To what extent is an attempt made to modernize old equipment? Is this worth while? If old equipment is junked, is an effort made to salvage any parts? Are these worth the expense of reclamation? What is your experience as to the actual life of the average motor coach in terms of miles?"

Modernization Economical

When motor coaches have been worn out and the necessary repairs would amount to more than the mile-

age we could realize out of them, they are scrapped. First, old glass and fixtures, which might be serviceable on some other type of equipment, are removed, and the rest is cut up and sold for scrap.

Old equipment can be modernized very economically, providing adequate facilities are available, such as for installing new panels, posts, destination signs, interior baggage racks, new curtains, new linoleum on the floor and necessary body trim. Prices for this sort of work will vary, depending upon the size and type of equipment. It has been proven that by thoroughly rebuilding a body and bringing it up to the standard of modernized coaches of today, several thousand miles can be obtained with full satisfaction from the rehabilitated unit.

In scrapping old equipment, we use the salvaged parts as much as possible, providing we have equipment in operation of the same type and make. We have found that about 40 per cent of the parts are worth the expense of reclamation.

As to the actual life of a motor coach in terms of miles, this would be very hard to determine. It depends upon the thoroughness of the maintenance of the equipment throughout its life and the degree of modernization and rebuilding which the operator is willing to provide.

In reality, one might say that a motor coach has an endless life, in view of the fact that units may be replaced continually and necessary repairs made to the body as they are needed, which would automatically prolong the life and increase the mileage of a motor coach.

H. P. McDONALD,

Superintendent of Automotive Equipment
Missouri Pacific Transportation Co.

* * *



Loading Containers Onto Fruehauf Trailer Hauled by Mack Tractor



Northern Pacific Organizes Subsidiary to Conduct Highway Operations

Railway, through the Northern Pacific Transport Company, is prepared to supplement and augment its freight and passenger train service with motor coach and truck routes

The Northern Pacific has organized the Northern Pacific Transport Company, a Delaware corporation, through which the railway company is prepared to supplement and augment its railway freight and passenger service with highway and motor coach and truck service. The railway filed the certificate of incorporation with the Secretary of State of Minnesota, and applied to the Minnesota Railroad & Warehouse Commission for permission to operate motor trucks on the highways paralleling its lines between Minneapolis and St. Paul, Minn., and Duluth, the initial step in the program of augmented freight service.

In filing its application, the railway company contended that no state certificate is necessary because the company will not be engaged in common carrier service, but will simply augment its steam railway service. No regular schedules are proposed and the new service will be flexible,

Alton Gets Missouri Certificate

The Alton Transportation Company, motor coach operating subsidiary of the Chicago & Alton, has been granted by the Missouri Public Service Commission a certificate permitting it to operate motor coaches between Mexico, Mo., and Jefferson City, to supplant train service now operated over a branch line of the railway between these points. The certificate does not permit the Alton Transportation Company to handle any passengers between Jefferson City and Fulton, since an independent company holds a prior certificate covering that portion of the route.

The majority of the commission rejected the contention of the railway that it should have priority and preference in the granting of motor coach operating certificates, on the ground that it was first in the transportation field in the territory under consideration. One of the commissioners dissented from the decision of the majority, agreeing with the railway's contention.

depending upon the amount of business to be handled.

Primarily, the proposed operation is intended to expedite through service and local service for l.c.l. freight. Cars loaded with l.c.l. freight will be set out at strategic points on the line, where their loads will be transferred to trucks for delivery to nearby local points. Only station-to-station service will be performed.

It is expected that by this means the number of stops in the through-freight service will be curtailed and the through service speeded up. The trucks will meet the set-out cars at convenient points, and these points may vary from day to day.

The Northern Pacific has no definite plans for further similar service on its system, but is prepared to begin its highway operations as necessity demands. No motor coach service for passengers is proposed at this time.

All of the stock of the Northern Pacific Transport Company is owned by the Northern Pacific Railway. Charles Donnelly, president of the Northern Pacific, is president also of the Northern Pacific Transport Company. H. E. Stevens, vice-president in charge of operation of the railway, is vice-president of the transport company; R. H. Relf, assistant secretary of the railway, is secretary of the subsidiary, and the treasurer of the transport

company is P. B. Lacy, treasurer of the railway. The directors are Mr. Donnelly and Mr. Stevens, D. F. Lyons, general counsel of the Northern Pacific, and B. W. Scandrett and J. G. Woodworth, both vice-presidents of the railway.

Pickwick's 1930 Plans

"Nineteen thirty will be a banner year for the Pickwick Corporation and subsidiaries and affiliated companies, which have under way or in prospect the most ambitious expansion program in their history," according to a recent statement issued by Charles F. Wren, president.

"After stretching its network of more than 30,000 miles of motor stage lines from coast to coast and border to border," the statement continues, "Pickwick Stages and affiliated lines during the year just closed inaugurated a comprehensive motor coach system which before the end of 1930 is expected to traverse Mexico from the Rio Grande on the north to the Pacific ocean on the south.

"The past year has also witnessed establishment by Pickwick Airways, Inc., of a tri-weekly mail, express and passenger air line linking Los Angeles with Mexico City, Guatemala and El Salvador, one of the longest commercial air lines in existence. Further early extensions are contemplated in this 3000-mile system.

"Pickwick Corporation," Mr. Wren said, "has just completed erection of a \$200,000 motor coach plant at El Segundo for the manufacture of sleeper coaches and other rolling stock, and new terminal facilities have been added, notably at El Paso, Salt Lake City and several other points. The coming year will witness erection of a 200-room hotel terminal at Eureka, Cal., and a similar structure at Phoenix, Ariz. The Eureka Hotel alone will represent an investment of \$500,000.

"At Kansas City, headquarters for Pickwick-Greyhound Lines, there is in course of construction a combined hotel terminal and office building. The building will cover an entire city block; will be nine stories high, with 415 hotel rooms, and will cost \$3,500,000. Ten thousand motor coach travelers will pass through this terminal daily, it is estimated by Howard H. Morgan, general manager of Pickwick-Greyhound Lines. It will be known as the Pickwick Hotel.

"A deal has just been closed for erection of a 200-room Pickwick Hotel at Tulsa, Okla., at a cost of \$1,000,000. This hotel terminal as well as the one at Kansas City will be completed during 1930.

"In the Pacific Coast territory, Pickwick and affiliated stage lines will augment their rolling stock by addition of 100 new motor coaches of the most modern type and costing approximately \$1,250,000. This new equipment is scheduled for delivery before next summer's tourist rush. Pickwick's 1930 program includes, among other large projects, development of the Nite-Coach to the point where these sleeper motor coaches will be in operation on major stage lines throughout the country."

Special Taxes on Motor Coaches Exceeded \$25,000,000 in 1929

Special taxes imposed on common carrier motor coaches, during 1929, exceeded \$25,000,000, an average of more than \$500 for each coach, according to statistics gleaned in a recent survey of the National Association of Motor Bus Operators. This statement, the announcement points out, is based on the normal increase in both registration and taxation and takes into consideration the fact that 46,000 common carrier motor coaches paid a special tax bill of some \$22,000,000 in 1928, an average of slightly over \$478 per motor coach.

The National Association further estimates that the average motor coach engaged in common carrier service pays 24 times the special tax imposed on the average private automobile, 10 times that paid by the private truck, and 1 2/3 that imposed on common carrier trucks.

"The 1929 tax bill on these motor coaches," continues the statement, "would build a modern paved highway from New York City to Detroit and cover all maintenance costs for a period of ten years. This is based on an estimated cost of \$30,000 per mile and a maintenance cost of \$77 a year per mile.

"There is no doubt that this tremendous tax burden, which is in addition to all

other taxes, such as that on capital stock, corporate or business income, real estate, personal property, etc., is serving to handicap the normal expansion of an important agency of transportation. The taxes paid in the course of the year, aside from the special taxes, averages \$160 per motor coach.

"In 1928, according to the figures of 100 companies which operated almost 14 per cent of the common carrier motor coaches in the country, their total taxes amounted to 6.6 per cent of their operating income, 7.39 per cent of their operating expenses, and 60.47 per cent of their net operating income, leaving a balance after deducting taxes of only 4.3 per cent of their revenues or 5.88 per cent on their total investment.

"Preliminary estimates indicate that complete figures for 1929 will show that common carrier motor coaches handled a total of one and one-half billion passengers in 1929. In addition, this traffic is carried by an industry with more than \$275,000,000 invested in rolling stock and terminal facilities. There is no form of transportation which has made such tremendous strides in public service and the heavy tax burden threatens the present rate structure."

Nebraska Operators May Substitute Bond for Liability Insurance

The Nebraska Railway Commission has issued an amendment to its original order relating to the filing of bonds by motor coach operators, in accordance with an opinion of the attorney general, to the effect that the operators should be permitted to substitute a bond for a liability insurance policy, if they choose to do so.

"It may be that an insurance policy is more desirable than a bond," the commission order states, "but that is a matter of policy that only the legislature has power to determine.

"The distinction between a bond and an insurance policy should be kept clearly in mind. While they equally protect the public, they are entirely different as affecting the motor coach operator. If the operator carrying insurance has an accident resulting in a \$10,000 damage, the insurance company pays the person or persons injured, or settles judgment for the loss, and the operator of the coach is relieved of liability and owes the insurance company nothing therefor. His whole liability to the insurance company is represented by the premium that he pays.

"If, on the other hand, an operator having a bond has a similar accident, with the same damage resulting and the bonding company pays the person injured the \$10,000, the bonding company looks to the operator for the repayment of the \$10,000.

In the one case the operator loses nothing. In the other case, he loses \$10,000. In other words, an insurance policy protects the operator and the public, while an indemnity bond protects only the public. The cost of an insurance policy is, as may be readily seen, much greater than the cost of the bond. In all cases, a bonding company requires indemnity from the operator, and unless he can furnish such indemnity he cannot secure a surety bond to protect the public."

The commission fixed the following amounts of bonds for motor coaches of different capacities: 12 passengers or less, \$20,000; 13 to 20 passengers, \$40,000; 21 to 30 passengers, \$60,000; over 30 passengers, \$80,000. If more than one motor coach is operated, the minimum amount of the bond is based upon the foregoing figures, and for two motor coaches is 150 per cent of the amount required for one motor coach; for three coaches, 180 per cent; and 20 percent additional for each coach up to and including 10, with 10 per cent additional for each coach in excess of 10.

The order requires that any company issuing a bond must be licensed to do business in the state, and must comply with the ruling of the commission requiring the maintenance of a reserve of not less than \$300,000.

Colorado Traffic

According to the Colorado Public Utilities Commission, intrastate motor coaches in Colorado carried 1,448,622 passengers during 1929. The motor coach lines as a whole, earned a net income of approximately \$250,000.

Columbia Terminals Building New Shops

The Columbia Terminals Company of St. Louis, Mo., has awarded a contract to Charles B. McCormack & Son, of the same city, for the construction of a one-story brick and concrete paint shop, with dimensions of 37 ft. by 120 ft. The cost of the structure is estimated at \$15,000.

New Terminal at Newark, N. J.

The Public Service Corporation of New Jersey recently opened its new motor coach terminal on the upper level of Public Service Terminal, Newark, N. J. Among the motor coach operators to utilize the terminal are the People's Rapid Transit Company and the Greyhound Lines companies affiliated with the Pennsylvania.

Oregon Stages Acquires Northwest Line

The Oregon Stages, Inc., subsidiary of the Southern Pacific Motor Transport Company, on January 1 took over the operation of Pacific Stages between Portland, Ore., and Newport, Tillamook and Forest Grove. By this step, Oregon Stages assumed the operation of all major motor coach lines in the state of Oregon.

I. C. Seeks New Line

The Illinois Central has applied to the Illinois Commerce Commission for authority to operate a motor coach line between Centralia, Ill., and Cairo, a distance of 110 miles. It is proposed that the motor coaches to be operated over this line will replace two passenger trains now operating over the railway between these points.

Cotton Belt Purchases Texas Freight Line

The Southwestern Transportation Company, subsidiary of the St. Louis Southwestern, has purchased the Stevenson Motor Freight Line, operating motor trucks between Dallas, Tex., and Texarkana, via Greenville, Sulphur Springs, Saltillo and Mt. Pleasant, and between Sulphur Springs and Hughes Springs, via Winnsboro, Pittsburg, and Daingerfield.

Transfer of New York-Montreal Line

The Champlain Coach Lines, Inc., on January 15 acquired the New York-Montreal Motor Coach line which had been operated by the Grey Line Motor Tours. The Champlain Company is owned jointly by the Fifth Avenue Coach Company of New York and the Provincial Transport Company, which later will continue to operate its section of the route under the same arrangements as it formerly had with the Grey Line.

A.E.R.A. Convention at San Francisco

The forty-ninth annual convention of the American Electric Railway Association

will be held at San Francisco, Cal., from June 23 to 26 inclusive. Committees are now at work under the direction of W. F. Hill, manager, California Electric Railway Association and Edwin C. Faber, vice-president of Barron G. Collier, Inc., N. Y. The latter will have charge of arrangements for three special trains which are to be chartered to carry the delegates to the convention.

New Transport Corporation Formed in Delaware

The National Highway Transport Corporation has been formed as a Delaware corporation to deal in service and everything else relating to transportation, whether on land or water or in the air, according to recent newspaper reports from Dover, Del.

The capitalization is \$20,000,000, divided into 200,000 shares of preferred stock with a par value of \$100 per share, and 200,000 shares of common stock without par value. L. R. Davis, W. F. Maybury and G. F. Dick, all of Pontiac, Mich., are the incorporators.

Finnish Motor Coach Mileage Seven Times Railways

Estimates show that motor coach routes cover a total of 40,000 kilometers or seven times the distance traversed by the Finnish State Railroads, according to recent reports made public by the United States Department of Commerce.

Approximately 1,500 motor coaches are now in operation in the country, the report further points out and an additional 500 will shortly be placed in service. A plan of co-ordinating these highway services with train services of the state railways was inaugurated during the past year and some 30 motor coach lines already maintain co-ordinated schedules.

New Terminal Planned in New York

The Fifth Avenue Coach Company recently acquired title to three parcels of land in West Thirty-sixth and West Thirty-seventh streets, between Fifth and Sixth avenues, New York, where it is planned to erect a new motor coach terminal. The terminal will be built by the Union Motor Coach Company, Inc., a subsidiary of the Fifth Avenue Coach Company, and successor to the Waldorf-Astoria Motor Coach Terminal.

Three buildings which now occupy the property will be remodeled to provide the terminal facilities. It is contemplated that the new terminal will have capacity for more than 500 motor coach departures daily.

New Regulations Proposed in California

The Railroad Commission of California will consider new rules for the regulation of motor coaches operating in that state, at a hearing scheduled to be held on February 25. An important feature



At the Pennsylvania's New York Motor Coach Terminal—Pennsylvania Station in Background

of the new rules, the announcement states, is a requirement that drivers of all motor coaches come to a full stop before proceeding over any railroad grade crossing, unless there is a watchman on duty who signals the vehicles to proceed.

Motor coach and motor truck lines will be given an opportunity at the hearing to express any objections they may have before the rules and regulations contemplated are finally adopted by the commission.

Greyhound Lines Permitted to Acquire Ohio Routes

The Public Utilities Commission of Ohio recently granted authority to the Greyhound Lines, Inc., for the acquisition of three other interstate motor coach lines operating through that state.

The lines involved are the Pioneer Stages, Inc., operating between Ohio-Indiana and Ohio-West Virginia boundaries; the purchase price for this line was reported as \$257,000. The two other lines involved are the Detroit-Toledo-Cleveland Bus Line, acquired for \$275,000, and the Sunny South Lines, operating between Covington, Ky., and Detroit, purchased for \$43,800. At the same time the commission denied an application of the Interstate Transit, Inc., for permission to do intrastate business along its Covington-Detroit interstate route.

Pickwick Expanding Mexican Services

More than 800 route miles will be added to the Pickwick Company's motor coach and air transportation systems in Mexico with the inauguration before January 1 of a motor coach line from Mexico City south to the seaport of Acapulco and north to Pachuca, capital of the state of Hidalgo and the establishment of tri-weekly air mail, express and passenger service between Mexico City and Acapulco by way of Puebla.

The projected expansions will give Pickwick through motor coach service from the southern coast of Mexico bordering the Pacific ocean over 1,100 miles of highway to the northern border at Laredo. From here connecting motor coach lines will link the Mexican system with the transcontinental Pickwick-Greyhound Line at Oklahoma City.

Truck Rates Prescribed in Texas

The Railroad Commission of Texas recently issued an order, effective February 15, applying railroad l. c. l. freight rates to all motor truck lines operating within the state. The order followed a public hearing before the commission, at which the railroads opposed granting of rates to the motor truck operators equivalent to their carload rates.

The hearing was held at the request of the Texas Truck Owners' Association, which organization had prepared a



Passengers Boarding B. & O. Train Connection Motor Coach at Its Forty-Second Street Station in New York

schedule of rates that it hoped to have adopted. In opposing the application of trucking rates equivalent to their carload rates, the railroads contended that the truck rate should include a charge for collection and delivery, a service which motor trucking lines performed without additional charges above their published rates.

S. A. E. Elects Officers

Edward P. Warner, former assistant secretary of the Navy for Aeronautics, was elected president of the Society of Automotive Engineers at its annual dinner in New York on January 9.

Other newly elected officers and members of the council are:

VICE PRESIDENTS

Chance M. Vought, representing aircraft engineering.
Bruce G. Leighton, representing aircraft engine engineering.
Otis D. Treiber, representing Diesel engine engineering.
Arthur J. Scaife, representing motor truck and motor coach engineering.
George L. McCain, representing passenger car engineering.
William N. Davis, representing passenger car body engineering.
John Younger, representing production engineering.
Frederick C. Horner, representing transportation and maintenance engineering.

MEMBERS OF THE COUNCIL

Ralph R. Teetor.
Frederick K. Glynn.
Arthur W. S. Herrington.

TREASURER

C. B. Whittelsey, Jr.

Missouri Freight Lines Exempt From Tax

Motor truck lines operating in Missouri are subject to the same laws and regulations as motor coach lines excepting that no means exist whereby the for-

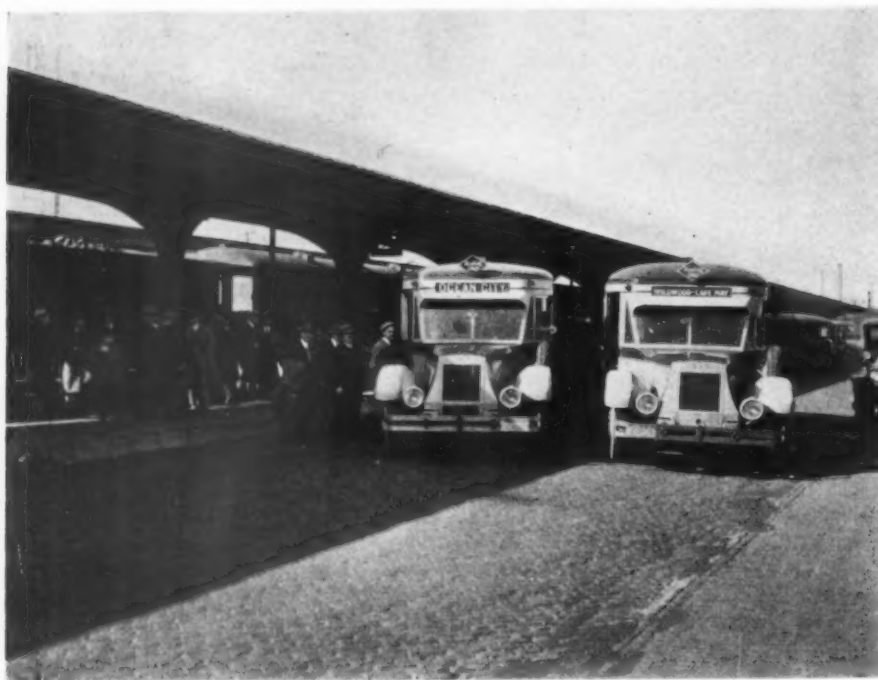
mer may be taxed on the same basis. Taxes under the present law are levied on a seating basis, and in a recent decision the Public Service Commission held that there was no means of applying this basis to the trucks.

The case was that in which the commission issued an order authorizing the Missouri Motor Distributing Corporation to establish a highway freight route between St. Louis and Kansas City. In the course of its decision in this case, the commission spoke of the tax as follows: "As the freight trucks are seatless, the law may be attacked as unconstitutional, because it discriminates in favor of freight lines."

South Carolina Denies Five Applications

The South Carolina Railroad Commission recently denied the application of five motor transport lines for permission to operate in that state. The denials were on the ground that "no sufficient showing of public convenience and necessity was made to warrant the granting of certificates."

The applications denied were those of the Conway-Charleston Express to conduct freight service between Charleston and Conway; the Camel City Coach Company for permission to operate motor coach service between Camden and the North Carolina line and between the North Carolina line and Darlington; the Southern Motor Transit Company of Virginia for permission to operate motor coach service from the North Carolina line to the Georgia line over Federal route No. 1 and the Safety Transit Company for permission to operate motor coach service between the North Carolina and Georgia lines via Cheraw, Dar-



Co-ordinated Service on the Reading at Atlantic City, N. J.

ington, Florence, Lake City, Kingstree, Charleston, Walterboro and Yemassee.

Georgia Operators Granted Tax Injunction

Motor coach operators in the state of Georgia, who are said to be paying 11 separate taxes to the state, have secured a temporary injunction against a twelfth tax, based upon mileage operated, which was imposed by an amendment to the General Laws passed by the 1929 Legislature and made effective January 1, 1930. Eighteen coach lines filed a petition for an injunction in the Superior Court of Fulton county, and a temporary restraining order was issued by the court. A further hearing on the case was to be held January 21.

The 11 taxes now paid by the motor coach lines, as enumerated in their petitions, are as follows: A property tax; a six-cent gasoline tax; a tax for vehicles of \$25, under one section of the Motor Carrier Act; a tax of \$35 on certificate; a mileage tax ranging from one-fourth cent per mile to two cents per mile; license fees of \$25 to \$50 per vehicle; a license tax of \$5 to \$50 per vehicle; a license tax of \$25 for each truck or trailer; a motor license tax ranging from \$35 to \$1,125 per vehicle; an income tax, and a license tax on foreign and domestic corporations.

Urges Stopping Distance as Basis of Traffic Regulation

Rather than limit the speed of a motor vehicle on the highway or city streets to a certain number of miles per hour, with this speed varying according to each individual state or city laws, as is done at present, a ruling that would define the distance within which a vehicle must be able to stop was recently advocated in a statement issued by W. T. Palmer, man-

ager of the Russell Manufacturing Company.

"This stopping distance would have to be variable according to the various conditions under which motor cars operate," the statement continued. "A legal speed limit could be very easily determined by following an extremely simple rule, in other words: 'All vehicles must operate at a speed consistent with their ability to stop within the proper margin of safety and the assured clear course ahead.'"

"Speed is only one of the factors that determines the stopping distance of an automobile. The stopping distance with relation to the clear course ahead, and not the speed, is the most important factor of safety."

Pickwick Earnings Increase

Net earnings of \$632,199, after interest and preferred dividends but before federal taxes and depreciation, were reported by the Pickwick Corporation for the nine months ending September 30, 1929, according to a recent announcement by Charles F. Wren, president. This is equivalent to 98 cents a share on the common stock now outstanding.

The net operating profit of the corporation for the nine months totaled \$790,315, and compares with \$935,743 of net operating profit earned during the entire year 1928.

The foregoing figures in the statement do not reflect the \$1,465,000 received by the Pickwick Corporation through the merger early last year of its motor stage system in the formation of the Pacific Transportation Securities, Inc., and Pickwick Greyhound Lines, Inc. This amount was applied directly to surplus.

"Gains have been made by Pickwick Corporation steadily throughout the year," Mr. Wren stated, "and indications are

that an even larger rate of increase may be expected for the final quarter." On September 30, 1929, current assets of the Pickwick Corporation totaled \$1,714,862 and total current liabilities \$369,881.

Van Sweringens Acquire Interest in New York Trucking Concern

In line with action taken during the last few years by various anthracite coal roads, the Erie, within the last week, has organized the Pittston Company, for the purpose of taking over the production and distribution of coal from mines formerly owned by the Erie.

In accordance with arrangements approved by the Erie directors, the new company has been organized under the laws of Delaware with broad corporate powers. "Its main purpose," says the circular issued to Erie shareholders, "will be to take under lease the anthracite coal properties now operated by the Pennsylvania Coal Company and the Hillside Coal & Iron Company (whose entire capital stock is owned by the Erie) and to mine and distribute the coal derived from those properties. Appropriate leases have been executed whereby the Pittston Company will take over the coal mining operations of the Pennsylvania and Hillside Companies and purchase the coal so mined. These leases are for a term of 25 years with options of renewals until the exhaustion of the coal. To provide additional distribution of coal more nearly to meet the capacity of the mines, the Pittston Company has contracted for the purchase of stock interests in certain companies, all of which save one are engaged in the business of distributing coal, the one exception controlling the stock of various companies some of which are engaged in such business."

The exception referred to, the United States Distributing Corporation, is a holding company controlling through stock ownership Pattison & Bowns, Inc., wholesale coal distributors; the West New York Coal Company, retail coal dealers; the Shanferoke Coal & Supply Company, wholesale coal sales agents for the Hudson Coal Company, operating various Delaware & Hudson mines; Independent Warehouses, Inc., operating a chain of free and bonded merchandise warehouses and off-rail freight stations in New York City, and the United States Trucking Corporation, with an extensive trucking service between railroad freight stations and piers and merchants and shippers in New York City, as well as numerous other subsidiaries.

Purchase by the Pittston Company of a substantial stock interest in the parent company—the United States Distributing Corporation—is said to be for the purpose of securing an interest in Pattison & Bowns, and thereby assuring an adequate sales outlet for anthracite from the Erie mines. No change in the management or present status of the United States Trucking Corporation as an independent organization is contemplated, it is said, and it is understood that no change will be made in its present contracts with the

Pennsylvania, Lehigh Valley, New York Central, New York, New Haven & Hartford and other roads for which it now performs trucking services in New York City.

The Pittston Company, with an authorized capitalization of 2,500,000 shares of no-par common stock, is raising approximately \$20,000,000 by the sale of 1,075,100 such shares at \$20 each to Erie stockholders in the ratio of one share of Pittston for each two shares of Erie stock held. Owners of large amounts of Erie stock, including the controlling Van Sweringen interests, have announced their intention of taking their full pro rata share of Pittston stock. Acquisition of a voice in the control of the trucking and warehouse interests appears to be largely a by-product of the transaction with reference to the coal properties.

Money secured from the stock sale will be used to purchase shares of the Pennsylvania Coal Company and the Hillside Coal & Iron Company from the Erie and to acquire the interests in the United States Distributing Corporation and other coal sales companies necessary to insure outlets for the products of those mines.

New Taxation Plan Proposed in Virginia

Revision of the Virginia statutes relating to the taxation of motor carriers has been recommended in a report to the general assembly by a corporation commission following the survey of motor vehicle transportation facilities directed by the 1928 legislature. The report and recommendations of the commission were published in a recent issue of the United States Daily.

The present Virginia taxation plan for common carrier highway passenger vehicles includes a consideration of weight, seating capacity and mileage in addition to which these motor coaches pay the five-cent gasoline tax imposed on all motor vehicles operating within the State. The commission, in the report under review, recommends that motor common carriers of passengers and freight be taxed like commercial trucks and assessed in addition $1\frac{1}{2}$ per cent of their gross receipts.

The gasoline tax, the report says, constitutes the heaviest tax obligation to be met by the motor carriers, amounting to 55.5 per cent of all the State and local taxes paid by them. Seat mileage taxes comprise 30.6 per cent of total taxes, while other State and local taxes, apart from the special valuation tax assessed upon public service companies generally, make up 12.6 per cent of the total. This last class of taxes consists in the main of property taxes payable to the local governments, and of a negligible sum payable on account of State income taxes, according to the report.

"The motor vehicle carrier has added much to the material development of our State and Nation," the report says, "and is an essential element in the future transportation needs of this country. Motor vehicle transportation will

advance in unison with the continual extension of the highway system."

The recommendations of the commission relative to a change in the method of taxing motor coaches follow:

1—Remove the present passenger seating capacity mileage tax.

2—Provide for the taxation of such carriers in the same manner as private operators of passenger cars; namely, on weight of vehicle at the rate of 70 cents per 100 pounds.

3—Secure an additional road tax to be based upon the volume of business done in the State at the rate of one and one-half ($1\frac{1}{2}$) per cent of gross receipts.

Elimination of Municipal Consents Urged in N. Y.

Elimination from the New York law covering common carrier motor coach operation, of the provision requiring that every community served must give its consent to proposed lines, was advocated by A. Raymond Cornwall, of the Colonial Motorcoach Transportation Co., Watertown, N. Y., at a recent session of the hearing before the legislative commission which is investigating proposals for the revision of the public service law in that state.

Mr. Cornwall defended his recommendation with a charge that there is at present much petty extortion, and obstructive tactics on the part of local officials or individuals with political power in the several communities where motor coach lines are proposed. He thought that an elimination of the provision requiring municipal consent would eliminate these practices.

"Most of that sort of thing is very petty," the newspaper reports quote Mr. Cornwall as stating. "Some of it is not so petty. Sometimes the operator has been required to buy an automobile for an official. In other cases it might be a suit

of clothes, or even a bottle of whisky."

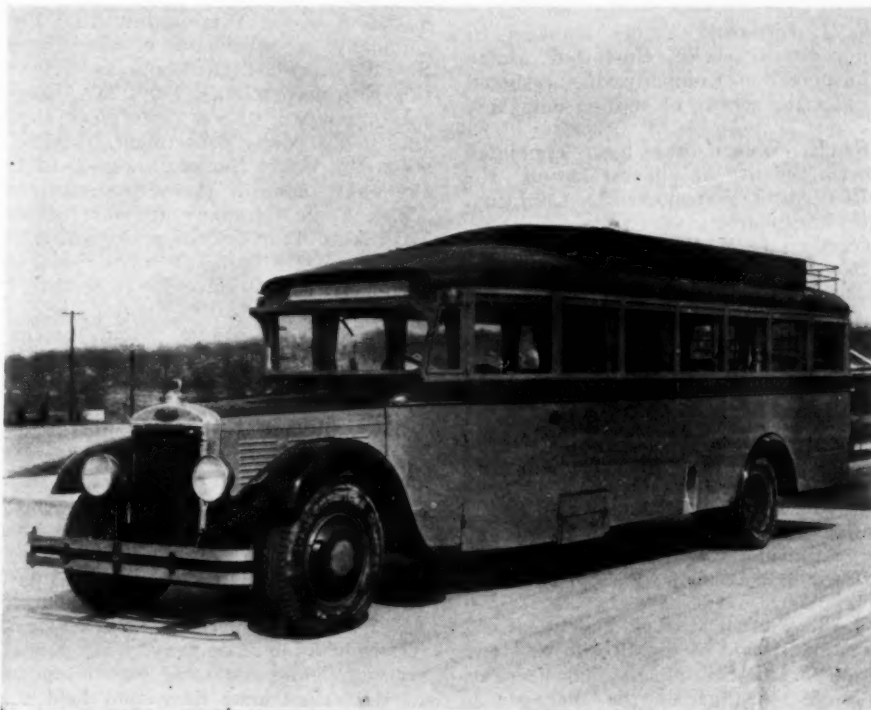
Mr. Cornwall said further that the present law is sufficient in the matter of inspection and safety measures, but added that large increases are needed in the inspection staff of the Public Service Commission since he thought that many other classes of public vehicles would have to be brought under regulation of the commission at least to a limited degree.

Pickwick Capitalization Increased

Stockholders of the Pickwick Corporation recently approved the proposal of the board of directors to increase the capitalization of the company from \$10,000,000 to \$15,000,000. The plan contemplates the issuing of an additional \$1,000,000 in two- and three-year $6\frac{1}{2}$ per cent collateral trust notes; an increase in the company's common stock, bringing the total outstanding stock to \$10,000,000 and an increase of from \$2,000,000 to \$4,000,000 of the outstanding 7 per cent preferred stock.

The proceeds from the sale of the collateral trust notes will be used to reimburse the company's treasury for recent capital expenditures and to provide for projected expansions. None of the newly authorized stock, however, will be issued at this time, but will be held in reserve until such time as funds are needed for further expansion.

In a statement recently issued by Charles F. Wren, president of the Pickwick Corporation, the financial status of this company was summarized. This statement revealed that during the first nine months of 1929, the value of Pickwick investments in land, buildings and equipment, comprising about 18 per cent of the total assets increased from \$2,292,027 to \$2,415,511, after depreciation and other charges. During the same period, in-



Mack Motor Coach in Highway Passenger Services of Central of Georgia

vestments embracing more than 55 per cent of the company's gross assets increased 15 per cent, or from \$6,603,726 to \$7,586,380. These investments, the statement points out, include common and preferred stocks of and advances to subsidiary and affiliated companies.

Jersey Central Municipal Consents Approved

The Board of Public Utility Commissioners of New Jersey recently approved municipal consents which had been granted the Jersey Central Transportation Company, highway subsidiary of the Central of New Jersey, for the operation of two motor coaches between Lakewood and Toms River, N. J. The route is approximately 17 miles in length.

Officials representing the municipalities to be served by the proposed route appeared at the hearing in favor of the application, while no opposing witnesses presented testimony. The board found that the testimony indicated a community of interest between Lakewood, Lakehurst and Toms River, and that the proposed service would improve transportation in that section of the State.

Orders for Equipment

THE BURLINGTON TRANSPORTATION COMPANY, highway subsidiary of the Chicago, Burlington & Quincy, has accepted delivery of two 198-in. wheelbase A.C.F. motor coach chassis equipped with 21-passenger full headroom bodies.

THE SOUTHWESTERN TRANSPORTATION COMPANY, subsidiary of the St. Louis Southwestern, has accepted delivery of seven Type W Yellow parlor coaches.

Motor Transport Officers

R. J. Littlefield former manager of motor coach service, Boston & Maine Transportation Company, has resigned to enter the service of another company.

R. R. Wilson has been appointed superintendent of operation of the Union Auto Transportation Company, with headquarters at El Paso, Texas., succeeding **J. W. Krug**, transferred. Mr. Wilson will have jurisdiction over territory from Douglas, Ariz., to El Paso, Texas., and from Safford, Ariz. to El Paso.

E. F. Parks has been appointed superintendent of operation of the Union Auto Transportation Company and the Pickwick Stages System, with headquarters at Phoenix, Ariz., succeeding **R. R. Wilson**, transferred. Mr. Parks will have jurisdiction over territory from El Centro to and including Safford and Douglas, Ariz.

J. S. Conlon, superintendent of the Boston division of the Boston & Maine Transportation Company, has been appointed assistant to the manager of motor coach service, succeeding **H. C. Ahern**, promoted. **E. A. Chase**, manager

of the Portsmouth division, has been appointed superintendent of the Boston division, replacing Mr. Conlon and **Ralph Ramsdell**, chief clerk at Portsmouth, has been promoted to the position of manager of the Portsmouth division, succeeding Mr. Chase.

Herbert R. Leigh, former superintendent of the North Coast Transportation Company, has been appointed general superintendent of the Union Pacific Stages, with headquarters at Portland, Ore. Mr. Leigh was born on September 30, 1889, at Chicago. He attended the Seattle High School and commenced his business career on May 22, 1909 with the Puget Sound Power & Light Com-



Herbert R. Leigh

pany and allied companies, as meter reader in the steam heat department of the Seattle Electric Company. He continued in this work until November, 1910, when he was transferred to the mines department holding the position of coal sales agent until 1915, when the mine was closed. On November 15, 1915, Mr. Leigh was appointed superintendent of the Washington Auto Bus Company, a subsidiary of the Puget Sound Power & Light Company. When this line was sold in 1919, Mr. Leigh was appointed station betterment engineer in the power department. In 1922, when the Puget Sound Power & Light Company bought the Seattle-Everett Union Stage Company and formed the Park Auto Transportation Company, he was appointed general superintendent, holding this position until December 1, 1924, when the Seattle-Everett division was sold to the Puget Sound International Railway & Power Company, and he was transferred to Tacoma as superintendent of stage operations for the Park Auto Transportation Company and the Stage division of the Puget Sound Electric Railway. On October 1, 1926, the Park Auto Transportation Company purchased the Camas Stage Company, the Northwest Transportation Company, and the Stage Division of the Puget Sound Electric Railway, and consolidated them all into the North Coast Transportation Company. Mr. Leigh was appointed operating superintendent of the consolidated lines, and held this position until he accepted his recent position.

Harold C. Ahern, who has been appointed manager of motor coach service of the Boston & Maine Transportation Company, with headquarters at East Cambridge, Mass., was born on April 8, 1896, at Lyndonville, Vt. He was educated at Lyndon Institute, Middlebury College and Columbia University, entering the service of the Boston & Maine



Harold C. Ahern

Transportation Company in June, 1926. He was appointed chief clerk in the manager's office in July, 1926, and in January, 1928, he was promoted to the position of assistant to the manager of motor coach service. He served in that capacity until December, 1929, when he was promoted to manager of motor coach service.

Among the Manufacturers

Mack Trucks, Inc., has opened a new showroom at Forty-Fourth Street and Lexington avenue, New York City.

John M. Howard, advertising manager of the **General Motors Truck Company**, has been appointed assistant sales manager in charge of sales extension. **Henry T. De Hart**, has been appointed manager of advertising and sales promotion.

George H. Palm, formerly connected with the new development division of the Yellow Coach & Manufacturing Company, has been appointed engineer in charge of radiator construction and equipment with the **Young Radiator Company**, Racine, Wis.

John W. Thomas, vice-president of the **Firestone Tire & Rubber Company**, has been elected vice-president and general manager. **Lee R. Jackson**, general sales manager has been elected vice-president and a director, and **Bernard M. Robinson**, assistant secretary, has also been elected a director.

Trade Publications

BLACK & DECKER, Towson, Md., have issued a 1930 catalogue of electric tools for automotive maintenance. Hand drills and attachments, sanding machines, portable and stationary grinders, and valve refacing and testing tools are described.